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<b>(54) Title:</b> CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD  <b>(57) Abstract</b>  A customer relationship management system and method provides and implements a multi-phase closed-loop approach, including specifying, analyzing, designing, executing, and tracking operations associated with a marketing campaign. Marketing campaigns are developed based on defined constraints, and subdivided according to segments and cells. Full support for distinct marketing channels, each having unique characteristics, is provided.		

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## CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD

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### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates generally to software for marketing applications, and more particularly to a system and method of planning and implementing customer relationship management.

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#### 2. Description of Background Art

Historically, marketing techniques relied on individual contact between the proprietor and each customer of a business. Because of the personal relationship that was able to develop in such an environment, the proprietor knew all of his or her customers and could provide personal service to them. For example, in a banking environment, where the proprietor was a banker, he or she would keep track of the needs and means of each customer, how much credit risk each customer represented, how to maintain customer satisfaction in a individualized way, and other characteristics.

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Large-scale customer service operations and stores no longer have the luxury of such individual contact. Stores, banks, and other such establishments are able to maintain customer satisfaction, to some extent, by attempting to classify customers into groups, and treating all customers in each group alike. This segmentation is applied to the services and products offered to customers, as well as to the marketing efforts employed to attract and maintain customers. Much of this marketing is done through mass media, which results in a loss of the ability to distinguish among individual customers and potential customers. Another common marketing technique is direct mail, wherein an offer is mailed to a large number of prospective customers. Direct mail marketing techniques suffer from many of the same problems listed above. In addition, these large-scale techniques tend to diminish the capability

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of building long-term relationships, instead treating each transaction as a separate, isolated event.

As marketing tactics and techniques become more complex, the tasks of maintaining, tracking, and developing customer relationships become more difficult.

- 5 Marketeers have relied upon a combination of tools, including databases, expert systems, decision support software, and the like, to perform customer relationship management functions. In many cases, these diverse tools and techniques do not operate in an integrated manner; as a result, inefficiencies are introduced and customer relationships suffer. Marketing resources are not used efficiently.
- 10 Customers may receive conflicting and/or contradictory messages from the same organization, the wrong market segments may be targeted, potential customers may be missed, or existing customers may be driven off through error or mistreatment.

- Such problems and pitfalls are often caused by the failure of existing tools to provide a systematic, closed-loop customer relationship management system. Several
- 15 tools are available for decision support and customer tracking, such as Valex from Exchange Applications, Analytix from Experian's Customer Insight Group, P/CIS from Harte Hanks, and Pinnacle from Harland, among others. In addition, other database-driven tracking systems are available for performing various types of analysis and breakdowns of customer data; these include, for example Model1 from
- 20 Unica, SAS Enterprise Miner, SPSS, and the like. Limited campaign management support is available from products such as Vales from Exchange Applications, Prime Vantage from Prime Response, and the like. None of these systems, however, provides an integrated approach that can use the data to design a customer relationship management plan, and execute and track the results of the plan.

- 25 What is needed is a system that can manage the complete life cycle of a customer relationship management project. What is further needed is a system that provides software tools for use in all phases of customer relationship management in an integrated manner. What is further needed is a software system and method that can maximize results in customer relationship management by performing

specification, analysis, design, execution, and tracking functionality for the entire life cycle. What is further needed is a software system and method capable of integrating analytics such as data mining, predictive modeling, statistical and OLAP processing, neural networks, and the like, into a single framework designed to support the life cycle of customer relationship management.

#### SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a system and method of planning and implementing customer relationship management that address the above limitations of the prior art. The present invention thus enables businesses to employ economies of scale of larger operations and institutions, so as to reduce costs, while retaining the ability to tailor product and service offerings, as well as marketing efforts, to individual customers. The invention thus promotes the building of long-term relationships with customers, rather than treating each interaction as a stand-alone transaction. This is beneficial for both the business establishment and its customers: customer loyalty is enhanced, which reduces customer development costs; improved targeting of marketing campaigns reduces customer acquisition costs; and customers feel that the business is becoming more responsive to their needs and treating them as individuals.

The present invention accomplishes these goals by using a multi-phase closed-loop approach to customer relationship management operations. Five phases are implemented, although in alternative embodiments a different number of phases may be implemented. In general, the five phases track the complete life cycle of a database marketing project, including specification, analysis, design, execution, and tracking.

The specification phase includes defining the goal of the marketing project, defining constraints, and defining the customer universe. The analysis phase includes developing and scoring market segments, and validating constraints and goals. The design phase includes creating "cells" (described below), assigning offers to cells, and assigning channels through which to make the offers. The execution phase includes defining output formats, establishing a campaign schedule, and de-

livering data to channel databases. Finally, the tracking phase includes posting the responses to the offers made in this campaign, analyzing this data, and adjusting the campaign accordingly.

Each of these phases is described in more detail in the Detailed Description of the Preferred Embodiments. In alternative embodiments, the phases may include  
5 different sub-phases than those listed here, without departing from the spirit or essential characteristics of the claimed invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram of the overall flow of the method of the present invention.

10 Fig. 2 is a flow diagram of a specification phase according to one embodiment of the present invention.

Fig. 3 is a flow diagram of an analysis phase according to one embodiment of the present invention.

15 Fig. 4 is a flow diagram of a design phase according to one embodiment of the present invention.

Fig. 5 is a flow diagram of an execution phase according to one embodiment of the present invention.

Fig. 6 is a flow diagram of a tracking phase according to one embodiment of the present invention.

20 Fig. 7 is a block diagram of a system architecture according to one embodiment of the present invention.

Fig. 8 is a block diagram showing operation of a segmentation module.

Fig. 9 is a block diagram showing operation of a scoring module.

25 Fig. 10 is a flowchart showing a method of testing the quality of a selected predictive model.

Fig. 11 is a block diagram showing operation of a campaign manager module.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The techniques of the present invention can be applied to both product-centric and customer-centric campaigns and programs. In product-centric campaigns, the

user's focus is to identify the customers or households that will be targeted for a particular product or service. Such an approach may be used most commonly, for example, for one-step single-channel campaigns such as direct-mail campaigns. In some cases, product-centric methodologies may also be used for multi-step and/or multi-channel campaigns.

In customer-centric campaigns, the user's focus is to identify the most appropriate products to be offered to a particular customer or household, and through what sequence of offers and channels to approach the customer. Such campaigns tend to be more complex than corresponding product-centric campaigns.

Though the description provided below presents the present invention in terms of customer-centric marketing campaigns, the techniques may also be applied to software for a product-centric campaign.

Referring now to Fig. 1, there is shown a diagram of the overall flow of a method according to one embodiment of the present invention. This flow is presented as a database marketing project life cycle, having five phases: specification phase 101, analysis phase 102, design phase 103, execution phase 104, and tracking phase 105. Each phase will be described in turn, in terms of a user practicing the present invention. As will be understood by those skilled in the art, the steps of the present invention can be performed by an automated system, such as a software application.

In one embodiment of the present invention, in the course of performing the phases depicted in Fig. 1, the invention evaluates customers and/or prospective customers in terms of a number of metrics to establish their current positions in a multi-dimensional conceptual space. The customers are also evaluated with respect to their predicted positions in this space at some user-defined time. As will be seen below, specification, segmentation and other tasks are performed with respect to positions and potential positions in this space. This measurement and evaluation process allows the user to gauge the relative success or failure of an ongoing campaign and to make adjustments to the campaign plan accordingly.

Referring now to Fig. 2, there is shown a flow diagram of specification phase 101, according to one embodiment of the present invention. Specification phase 101 begins by defining 201 the marketing campaign's overall goal. For example, a goal in a customer-centric campaign might be to increase the profitability of its low-profit but high-potential customers by 20% in eighteen months. This might be achieved through a single campaign or through a series of related campaigns.

If applicable, customers are characterized by their position in a multi-dimensional space with each axis measuring a particular parameter such a profitability, loyalty, risk level, and the like. The campaign's goal is defined in terms of a position in the multi-dimensional customer space, with each specific goal corresponding to a distinct position in the space, thus defining a path to the desired position. The goal is realized by moving the customers within this space.

The goal of the campaign is expressed as the desired value of a target variable. Constraints on achieving the target value may be defined 202, to represent other business goals or restrictions. For example, for the customer-centric campaign discussed above, one constraint might be to focus only on a particular geographic area, and to avoid using loan products due to the company's asset/liability situation.

For a product-centric campaign, for example, if the campaign goal is to add new credit card customers, one strategy might be to offer no-interest credit cards. Although such a strategy would achieve the immediate goal of adding new credit customers, it would defeat the overall purpose of increasing profits, since revenue from interest payments would be eliminated. A constraint such as "do not reduce total company profits in the campaign" could be put into effect to eliminate the strategy.

In one embodiment, constraints are represented in the system as restrictions on values of parameters. For example one constraint might be represented as:

$$\text{TOTAL\_COMPANY\_PROFITS\_BEFORE} \leq \text{TOTAL\_COMPANY\_PROFITS\_AFTER} \quad (\text{Eq. 1})$$

This constraint specifies that the profits must not decrease as a result of the marketing campaign. The constraint can be checked both during the analysis and design phases, 102, 103, by comparing the predicted total profits to the initial profits, or during the tracking phase 105 by comparing the actual total profits to the initial profits.

Another example of a constraint might be:

$$\text{CAMPAIGN\_CONTRIBUTION\_TO\_COMPANY\_PROFITS} \geq 0$$

(Eq. 2)

This constraint specifies that the campaign have a positive contribution to company profits. Checking the constraint of Eq. 2 can be accomplished using domain knowledge, which is embedded in the system so as to facilitate such constraint evaluation.

Step 202 may also include, as an additional constraint, specifying a budget for the campaign, or for a set of related campaigns. Such a budget takes into account the various costs of executing the campaign, processing the responders, and maintaining the responders. Specific examples include mailing costs, credit check costs, monthly statements, and the like.

The invention then includes defining the customer universe that will be targeted through the campaign and the products that will be offered in these markets. For example, the campaign might target households that have secured a mortgage to purchase their first residence in the last six months. Particular products, such as gold and platinum versions of a particular credit card, might be offered to such households.

Referring now to Fig. 3, there is shown a flow diagram of analysis phase 102 according to one embodiment of the present invention. In this phase, the invention analyzes the goal of the campaign and determines its feasibility. Analysis phase 102 verifies that the goal can be met within the constraints set in specification phase 101, and in one embodiment determines what sequences of promotions are to be applied to each customer to achieve the goal.

The system measures and records variables that measure customers, as well as variables that measure campaign parameters such as response rates, budgets, expected and actual expenses, and the like. Variables can be classified into two categories—independent variables, which can be directly controlled, and dependent  
5 variables, which are controllable indirectly by modifying directly controlled variables. Generally, target variables are dependent variables.

The central problem addressed by the marketing campaign is to find values for independent variables that will meet the campaign goal, while satisfying the defined constraints. In performing this function, the invention employs calculators and  
10 reports to generate relevant values for dependent variables. Calculators include mechanisms for performing analysis by performing various calculations on variables, such as the break-even calculator described below.

Reports are a mechanism allowing the user to interactively modify parameters and see the effects on other parameters, in a “what if” form of analysis. Reports  
15 display various parameters of interest to the user in a visually meaningful manner, such as a graph, spreadsheet, or chart. The user can modify certain variables and see the results of such changes, in a manner similar to a spreadsheet application. Reports are supported by a set of calculators and models. The calculators are used to compute dependent variables, while the models provide the ability to predict values  
20 for variables. In one embodiment, such models operate using known statistical methods.

Analysis phase 102 begins by performing an exploratory analysis 308. This may include, for example, a break-even analysis to determine the expected break-even point for the campaign. Based on the cost of contacting each potential customer,  
25 and the expected profit from each acquired customer, a target response rate is determined.

One example of a break-even calculator is shown in Table 1:

Campaign's financial target	\$1,500,000.00
Expected average annual revenue per customer	\$100.00
Target mail response rate	1%
Target telephone response rate	10%
Percent of prospects targeted through mail	30%
Percent of prospects targeted through telephone	70%
Cost per mail prospect	\$1.00
Cost per telephone prospect	\$0.80
Processing cost per customer	\$2.00
<i>Number of customers needed</i>	<i>15,000</i>
<i>Number of customers to be approached</i>	<i>555,000</i>
<i>Amount needed for the campaign</i>	<i>\$564,000.00</i>
<i>Gross profit</i>	<i>\$963,000.00</i>

Table 1: A top-down break-even calculator

Table 1 shows a "top-down" calculator, in that it takes as input the various costs and the campaign goal, and calculates the needed budget for the campaign.

- 5 Alternatively, a bottom-up calculator can be employed, which starts with the campaign budget and determines if the campaign goals can be met. More sophisticated analysis may also be performed, including for example, taking into account attrition figures and other factors. Also, other types of calculators may be employed, as will be apparent to those skilled in the art.

- 10 Analysis phase 102 continues by defining 301 the segments in the identified market that will be targeted by the campaign. For example, first-year college students may be one segment. Segments may also be defined by other means, such as geographic criteria, income levels, family size, home ownership, and the like. These segments are scored with respect to certain criteria, such as risk, propensity to accept

an offer, and the like. Scoring includes determining a score for each segment that measure a particular characteristic, such as the propensity to buy a product, the likelihood of defecting within a year, and the like. For example, one such segment might be defined as "households with no children and low credit risk that have taken  
5 a mortgage to purchase their first residence in the last six months."

Segments can be defined in a variety of ways, including for example:

- Applying a query to the customer universe, or another segment
- Combining two or more segments
- Selecting a quartile or a decal based on a score
- 10 • Randomly or manually removing customers from a segment
- Removing customers that are duplicated in another segment, or in another campaign

Each segment has its own characteristics, such as response rate, channel sensitivity, propensity to purchase different products, and the like. To take into  
15 account these characteristics in order to determine likely success or failure of the campaign, a correlation model may be used.

Correlation models capture empirical relationships among variables, and may be used when direct relationships are not known. Correlation models are built using a variety of techniques, including statistical analysis, neural networks, rule-based  
20 systems, and the like. In the present invention, such relationships are captured in a set of predictive models that model common relationships. One example is a predictive model that predicts whether a household or customer will accept a particular offer of a particular product, such as a gold credit card. In one embodiment, predictive models are employed to capture correlation models.

25 Based on the cost of contacting each potential customer, and the expected profit from each acquired customer, a target response rate is determined.

In an alternative embodiment, a dependency network may be used to describe dependency relationships among variables. A dependency network is defined when a formula is used to derive a variable from one or more other variables. The

dependency network traces such dependencies, and establishes a precise relationship among variables. Such a relationship can then be used to perform analysis on the campaign and gauge its likelihood of success according to defined goals and parameters. In one embodiment, dependency networks are captured in the  
5 calculators.

In one embodiment, step 301 also includes defining the number and type of campaigns that will be executed on each segment. This substep may be performed for each defined product of the campaign, or for each established customer or customer segment. For example, the no-children low-risk households mentioned  
10 above might be targeted with two campaigns, such as an awareness campaign followed by a solicitation campaign.

In one embodiment, step 301 also includes determining methods and channels for each campaign. This determination is made based on the break-even analysis and capacity availability of each channel to accommodate the workload imposed by the  
15 campaigns. Following the example being discussed, the gold and platinum credit cards might be offered through direct mail and telephone solicitation.

In one embodiment, a product path assignment for each segment may be developed as well. The product path assignment is a sequence of products that will be offered successively to the customers in a segment, in an effort to meet the  
20 campaign goals. The product path assignment is based on a report that shows, for each customer:

- the products currently owned
- the profitability from those products
- the propensity of the customer to buy each additional product
- 25 • the expected profitability from each of those products

From this report, the user can determine the optimal sequence of products to offer the customers in each segment, in order to maximize the contribution to the campaign goals, while meeting relevant constraints.

Analysis phase 102 also includes validating 304 the constraints and goals of the marketing campaign. This includes, for example, identifying any conflicts between the products offered in the campaign and products offered by any other campaigns already in production, possibly by other parts of the same organization. This step  
5 attempts to avoid sending conflicting offers or messages to potential customers. The expected success of the campaign in terms of the defined goal is assessed. If the goal is not satisfied 306, analysis phase 102 returns to step 308. If the goal is satisfied 306, the phase ends 307.

In one embodiment, analysis phase 102 takes place in accordance with  
10 positions and potential positions of customers in the multi-dimensional space described above. Customers are segmented according to their real and potential positions. A path through the multi-dimensional space is determined, that takes the customers from the current position to a position that will satisfy the campaign goal.

In one embodiment, the path through multi-dimensional space is implemented  
15 using a set of predictive models 901. For example, a "propensity to buy" model may be applied to each customer to determine which product he or she is most likely to buy. Additional predictive models (such as a "profitability model", a "risk analysis model", a "loyalty index model", and the like) may then be applied to determine where such a purchase will lead the customer in the multi-dimensional space. This  
20 determines the first step in the path for each customer. Next, the "propensity to buy" model may be applied to each customer again, but this time with the assumption that the first product has already been purchased. Repeating the process results in a series of steps on the path that the customer is likely to follow. The user can decide that he or she would like the customer to follow a different path, in which case the models  
25 provide information that is helpful in designing new products and campaigns that will steer the customer along the desired path.

Referring now to Fig. 4, there is shown a flow diagram of design phase 103 according to one embodiment of the present invention. Design phase 103 begins by selecting 404 a market segment and organizing 401 the segment into smaller groups

called "cells". The members of a cell receive the same offer. A cell is thus the smallest unit of customers that is the target of a promotion. An example of a cell is the top five percent (in terms of profitability) of the no-children, low-risk households; another example is a random sample of ten percent of the entire segment. Cells are specified

5 in terms of filters or queries applied to a segment that may include, for example:

- sampling (nth, random, or stratified)
- fixed quantity, percent (quantiles, deciles, etc.), nth factor
- ranking based on scores
- duplication (members of a selected cell that also belong to other cells)

10 In one embodiment, cells are further refined 405 using a set of business rules. For example, a rule might state "do not promote a customer more than once every three months."

A promotion is then created 406 and associated 402 with each cell. For example, the cell containing the top five percent of the most profitable households

15 might be offered a platinum credit card with no interest for one year and a \$15,000 credit limit. A channel is assigned, through which the offer will be made (such as telephone solicitation, direct mail, and the like). By taking into account the size of the cell, and the capacity of the assigned channel, the present invention is able to ascertain whether the assigned channel is able to accommodate the task assigned to it.

20 Available channel capacity is measured during the time period the offer will be made.

Referring now to Fig. 5, there is shown a flow diagram of execution phase 104 according to one embodiment of the present invention. Output formats are specified

501 as required by each channel. The campaign schedule is then developed 502. Finally, the necessary data is delivered 503 to each channel so that the campaign can

25 be put into effect.

The format expected for the promotions depends on the channel. For example, a mail center may expect magnetic copies of mail-ready files in the format of their mailing software. A call center may expect scripts that the telephone representative will follow during conversations with prospective customers. An automated teller

machine may expect different messages to be displayed when a customer inserts a bank card. Delivery of data 503 is performed according to the expected format for the channel being used.

Referring now to Fig. 6, there is shown a flow diagram of tracking phase 105 according to one embodiment of the present invention. Tracking phase 105 is performed by collecting 601 in a marketing database data about the results of the campaign; for example, the responses to the offers associated with the appropriate cell. Data is collected at some predetermined frequency, depending on the organization and on the channel being used. For example, data from call centers and World Wide Web sites may be collected daily, if appropriate, while data for mail channels may be more suited for weekly collection. Based on the collected data, the campaign's effectiveness is analyzed 602 by cell, channel, and by product/offer. The campaign is then adjusted 603 based on the analyzed data, for greater effectiveness and/or efficiency.

In one embodiment, tracking phase 105 analyzes results in terms of the multi-dimensional space described earlier. Customer positions are compared with expected positions, to determine whether the campaign is on target, or if the path through the multi-dimensional space needs to be modified. This process is repeated for each step in the path, until the goal is met and the campaign is over. The campaign thus consists of moving the customers through a series of steps to the target position.

Referring now to Fig. 7, there is shown a block diagram of a system architecture 700 according to one embodiment of the present invention, for performing the process described above. The architecture 700 shown in Fig. 7 may be implemented, for example, in a client/server computing environment. The client portion runs under an operating system such as Windows 95, Windows 98, or Windows NT Workstation, all from Microsoft Corporation. The server portion runs, for example, under the Windows NT 4.0 operating system, also from Microsoft Corporation. Alternatively, a Unix-based server may be employed, particularly for larger volumes of data.

The primary database for use in architecture 700 is customer data mart (CDM) 701, which may be implemented for example using SQL Server 6.5, Oracle 8.X for NT, or similar. A sharable meta-data layer may be implemented to permit all components to share data effectively, as is known in the art.

5        Data model 702 provides a framework for accessing and interpreting data from customer data mart 701. Data model 702 includes base attributes and derived attributes describing customers and potential customers. An example of data model 702, including base attributes and derived attributes, can be found in Appendix A. Data for data model 702 is determined based on the needs of various calculators and  
10       reports of segmentation module 704, report analysis and data mining module 705, campaign manager module 706, and predictive model library 901.

      Data model 702 is designed to provide efficient and convenient access to many different types of information. In one embodiment, customer information is stored in a dimensional structure to facilitate analysis. The campaign and tracking information  
15       is stored in relational tables. Derived data attributes are stored in denormalized and flattened tables for efficiency, if appropriate. Information in data model 702 is linked using appropriate keys, as needed.

      Data access layer 703 contains routines for accessing and manipulating data from data model 702 and CDM 701. Those skilled in the art will recognize that such  
20       routines are generally known for such operations in connection with databases. Modules 704, 705, 706, and 901 may call routines from layer 703 as needed.

      Segmentation module 704 performs segmentation operations in connection with the marketing project life cycle, as will be explained in more detail below. Report analysis and data mining module 705 determines scores for market segments,  
25       and makes the scores available to the user, as will be explained in more detail below. Campaign manager module 706 produces as its output a marketing campaign, as will be explained in more detail below.

      Graphical user interface 707 provides a front-end on the client computer for facilitating user access to the various functional modules of the overall system.

Referring now to Fig. 8, there is shown a block diagram depicting operation of segmentation module 704 according to one embodiment. Segmentation module 704 accepts data from CDM 701 and data model 702 as input. Module 704 produces segments set 801, which contains descriptions of market segments for use in other components of the system. Segments set 801 can be stored in CDM 701, or in file space of a client or server machine.

In one embodiment, module 704 accepts reports library 802 as input in generating segments set 801. Reports library 802 allows easy interaction with data from CDM 701 by facilitating the use of standardized reports. For example, two types of reports may be included in library 802: customer understanding reports 803, which provide an assessment of the type and level of relationship between customers and the company; and campaign effectiveness reports 804, which provide analysis on the results of previously executed marketing campaigns so that the campaign can be refined and improved.

Examples of customer understanding reports include:

- Marketing Campaign Management Status / Tracking Report
- Cross-Sell Status Summary Report
- Product Combinations Status Report
- Household Detail Status Report
- Officer Assignment Status Report
- Portfolio Segment Migration Report
- Portfolio Household Detail Changes Report
- Cross-Sell Sequences Report
- Organizational Levels Performance Status Reports
- Product Status Comparisons Reports
- Organizational Levels Performance Trends Reports
- Portfolio Entities Performance Trends Reports

Examples of campaign effectiveness reports include:

- Campaign-Specific Incentives Effectiveness Report

- Campaign-Specific Customer Trends Report
- Up-Sell Campaigns Effectiveness Report
- Transaction Channels Status Report
- Transaction Channels Trends Report
- 5      • Transaction Activity Status Report
- Organizational Levels Performance Deviations Reports
- Cross-Sell and Product Bundling Performance Deviations Report
- Transaction Channels Status by Organizational Levels Reports

All of these reports are generated by performing calculations on data from

- 10    CDM 701. Segmentation module 704 generates segments set 801 by performing two functions: selecting 805 a customer universe, and partitioning 806 the customer universe into segments. Selecting 805 involves defining a group of customers (individuals or households), which may include either the entire CDM 701 or a subset of the CDM 701. The user may specify such a subset through the use of a query,
- 15    which may include inclusion and/or exclusion clauses. Alternatively, the subset may be defined in terms of a view in the CDM 701. Partitioning 806 is performed by defining specific criteria for one or more segments in the customer universe.

- In one embodiment, segments are created interactively, in response to the user posing queries against the customer universe selected in 805 through a relational
- 20    and/or multidimensional query tool. For example, a segment may be created by posing a relational query requesting all households that own two banking products. Segments may also be organized hierarchically, so that the segment defined as “household that own two banking products” may include additional defined segments such as “households that own two banking products and have a car” and
- 25    “households that own two banking products and have a house”.

Interactive segmentation as performed in 806 may be done in two substeps: quickcounts, and record realization. The quickcounts substep determines the size of each segment, so that the user can elect to reject a segment as being too large or too small before the records associated with the segment are actually retrieved from

CDM 701. The user may refine a query for a rejected segment in order to obtain better results, if desired.

During the record realization substep, the segments specified as "accepted" by the user are processed. An identification code is assigned to each accepted segment, and the appropriate segment identification code is written to each record that belongs to the customer universe, as appropriate. Since a particular record may belong to more than one segment, and the user may elect to allow duplicate records in segments if desired, all appropriate identification codes must be associated with the corresponding record.

Once segmentation module 704 has performed the partition into segments, the segments are stored, for example at the client machine or in CDM 701. If stored in CDM 701, appropriate security is implemented for each segment so that only designated users may access, copy, and/or modify the segment.

Segmentation module 704 also provides graphic display of the distribution of values of the records found within a particular segment. The user may specify the attributes whose values are to be displayed, and user interface 707 then displays the data in a graphical form. For example, the display may include a bar graph listing the number or percentage of potential customers belonging to several different groups forming the segment.

Other methods of segmentation, such as automated segmentation, may also be implemented in alternative embodiments. In one such embodiment, automated segmentation using predictive models, as described above, is employed. The customer universe is segmented according to the first most likely product to buy. Each segment is then subdivided according to the next most likely product to buy. Continuing in this manner, a set of segments is developed, so that each segment follows along the same path in the multi-dimensional space.

An alternative technique for automated segmentation is based on known statistical clustering algorithms. A clustering algorithm breaks the customer universe into a set of clusters, so that the customers in each cluster are uniform with respect to

some criteria, and differ among different clusters according to the same criteria. These clusters then form the segments.

Referring now to Fig. 9, there is shown a block diagram depicting operation of report analysis and data mining module 705 according to one embodiment. Module 705 accepts input from segments set 801 (generated by segmentation module 704, as described above) as well as predictive model library 901. Output from report analysis and data mining module 705 is scored segments set 902 which may then be stored in CDM 701.

Predictive model library 901 contains a number of predictive models that may be used in scoring segments. Predictive models predict the expected value of some parameter. Such models are built by analyzing data having known values for the target variable, incorporating the information about the correlation between the target variable and other variables. When applied to new target data, the model can then use the learned correlations to predict values for target variables.

For example, library 901 may include the following models:

- "Potential life-time value": Predicts net present value of a customer if he or she fully utilized all appropriate products and services
- "Propensity to buy product": Predicts likelihood that a customer will buy a product
- "Risk level": Predicts amount of risk associated with a customer
- "Loyalty index": Predicts likelihood that a customer will defect
- "Predicted response": Predicts likely response of a customer to a given offer

Report analysis and data mining module 705 performs two main functions in generating scored segment set 902. It tests the quality of a selected predictive model from library 901, and it applies the selected predictive model to segments set 801.

Referring now to Fig. 10, there is shown a flowchart of a method of testing the quality of a selected predictive model. The model is applied to a set of customers

for which the target variable has a known value. The results of the model are then compared against the known value to determine quality of the model.

First, module 705 accepts 1001 the user's selection of a model from library 901. Generally, the user selects a predictive model based on the type of task (acquisition, attrition, etc.) and the product (credit card, loan, etc.). Module 705 then accepts 1002 the user's selection of a data set with recorded response data. Next, module 705 accepts 1003 user selection of the attributes of the data set that will be pertinent to the model testing. Alternatively, all attributes can be selected as being pertinent. If any attributes have special meaning, the user can identify 1004 these. Module 705 then checks 1005 that the selected data and attributes conform to the model's specification. This includes, for example, checking that the names of the independent variables in the data set are the same as the corresponding attributes of the selected model, checking that the dependent variable is the same, and the like.

Next, module 705 applies 1006 the model to the selected data set and compares 1007 the model's predictions to the known responses. In one embodiment, these results are plotted graphically, such as through a gains chart. Finally, the system accepts 1008 the user's acceptance or rejection of the model based on the comparison.

The procedure of Fig. 10 may be repeated for each of the selected models.

Once the selected model is tested in 903, it can be applied 904 to segments set 801, according to known techniques in the art of predictive model application. A set of scores from the model is generated. The scores are written as separate values in each record in the selected segment, and stored in CDM 701 as appropriate.

Referring now to Fig. 11, there is shown a block diagram depicting operation of campaign manager module 706 according to one embodiment. Module 706 is used in design phase 103 and execution phase 104 of the marketing life cycle. Module 706 accepts as input either segments set 801 from segmentation module 704, or scored segments set 902 from report analysis and data mining module 705. Module 706 produces a marketing campaign 1101 including cells 1103, offers 1104, channels 1105,

and schedules 1106. Marketing campaign 1101 may also be related to or integrated with other marketing campaigns, as desired.

Marketing campaign 1101 is identified by a unique identifier. Typical data that may be associated with campaign 1101 may include, for example:

- 5           • the campaign owner
- the campaign type (e.g. renewal, acquisition, cross-sell, and the like)
- customer universe size
- campaign budget
- actual expenses
- 10          • forecast response
- actual response
- number of segments in campaign
- number of cells in campaign
- campaign duration
- 15          • channels used.

Each of the elements of marketing campaign 1101 will now be described. Cells 1103 are created, as described above, by applying various filtering criteria to segments. In one embodiment, the user may specify that module 706 should store in a temporary data source (such as a flat file) the number of customers that “fall off” a

20          campaign because of the application of filters to a particular segment or cell. For example, if a segment contains 1000 customers, and a filter causes 200 customers to be left out of the campaign, these 200 names could be saved along with an identification of the filter that caused their removal, so that the user can retrieve this information if needed.

25          Cells may include control cells (a random sample of a segment, forming a control group that can be used to evaluate effectiveness of selection techniques, test cells (included in the campaign but do not receive the offer), and generic cells (members receive the offers through the prescribed channels).

Module 706 is also able to identify the percent of duplicates among a set of selected cells, so that the user can be notified of such duplicates. Duplicate records among a set of previously selected cells may be displayed for the user if desired. Also, the user may specify that duplicates be removed from selected cells, or that a subset of such duplicates be removed.

Campaign manager module 706 maintains a link between cells 1103 and the parent segment from which the cells were derived. A database table is developed and stored, which contains descriptions of the unique attributes of each cell 1103.

Such attributes include, for example:

- a description of the customer group being targeted in the cell
- the channel used to approach and contact the group described in the cell
- the treatment used to market to this group
- the allocated budget for the cell
- the expected results of the campaign for this cell
- the actual results (when available)

In one embodiment, these attributes are stored in the same table as the segment data itself.

Cells 1103 portion of marketing campaign 1101 shows the user the hierarchical organization of cells 1103, where appropriate. Offers 1104 associated with a cell are also displayed. The channels 1105 through which offers 1104 will be made are displayed. For each offer 1104, there is specified a list of acceptable actions the recipient of the offer may take. These include, for example, accepting the offer, requesting additional information, declining the offer, requesting removal from the list, and the like. Depending on the action taken, the recipient of an offer may or may not be included in subsequent campaigns.

Campaign manager module 706 also analyzes the response to offers 1104 in terms of success criteria, in order to derive a determination as to the overall success of the marketing campaign.

Offers 1104 that are associated with cells 1103 may be mutually exclusive in some cases (though not always). The user can specify such mutual exclusivity where appropriate, so that module 706 can take such factors into account when generating campaign 1101.

5        Offers 1104 output by module 706 also include the script to be used in making the offer. For example, in a direct mail channel the script is the text of the letter to be sent to the prospective customer. In a telephone solicitation channel, the script is the text that the customer support representative will read in communicating with the prospective customer. In an alternative embodiment, the offers 1104 output may  
10       point to a script that is stored in some format, such as a Microsoft Word file for example.

Channels 1105 are specified for the offers 1104 being made. These may include, for example, direct mail, telemarketing, fulfillment, newspaper ads, and the like. For each channel, various treatments are specified depending on the nature of  
15       the channel. These treatments describe distinct elements and specifications for executing the offer through the corresponding channel. Table 2 shows treatments for several examples of channels.

<u>Channel</u>	<u>Corresponding Treatment Describes</u>
Direct Mail	Contents of mailing package, creative offer, component costs
Telemarketing (inbound & outbound)	Vendor, scripts, offer, component costs
Fulfillment	Contents of fulfillment package, creative, application, offer, and component costs
Newspaper Ads	Publication, placement, circulation, creative, offer, and component costs

Table 2: Treatments for Several Examples of Channels

20

For each offer 1104, one or more possible actions can be specified. The user of the system can select from a master list of actions, as appropriate to the particular response of the customer. Such responses include, for example: "not interested",

"contact again in three months", "accept", "contact using another channel", and the like. For each such response, the user can define what actions should be taken. These can include, for example: making a different offer (perhaps increasing the incentive), scheduling for re-sending of the offer at a later time, changing the channel, and the  
5 like. The system allows the user to specify the action for each expected customer response.

Campaign 1101 also contains a schedule 1106 describing when each offer 1104 will be made to members of a particular cell 1103. Schedule 1106 also identifies and displays to the user other campaigns that are running at the same time as the  
10 campaign being created. Output can be generated, for example, by product, department, cell, segment, household, account, and/or customer. Such reports can be generated from available data by conventional report generation means.

Marketing campaign 1101 is provided as output 1107 to the user, to be displayed, printed, transmitted, and/or stored in a conventional manner. In one  
15 embodiment, output 1107 takes the form of data files for supporting the back end of a direct marketing process. Output 1107 may include, for example, formats or templates for external direct mail production houses and call centers. These templates facilitate population of data fields, calculated values, tracking codes, and test fields.

20 For example, for a mailing, the templates might include form letters, where the customer name and address will be filled in for each customer before printing. For a telephone channel, the templates might be in the form of scripts to be followed by a telephone representative, as well as guidelines for handling interactions not covered in the script.

25 Additional support and output information may also be provided, such as freeze files (capture record identifiers and selected data elements at the time the campaign 1101, segment, and cell were created to facilitate more accurate response analysis and modeling) and longitudinal marketing files (identify permanent segments and marking records in the database for extended periods of time).

From the above description, it will be apparent that the invention disclosed herein provides a novel and advantageous system and method of planning and implementing customer relationship management. The foregoing discussion discloses and describes merely exemplary methods and embodiments of the present invention. As will be understood by those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD

**APPENDIX A:**

5

**BASE ATTRIBUTES FOR DATA MODEL**

**DERIVED ATTRIBUTES FOR DATA MODEL**

10

## General Attributes

Household_key
HH_type
HH_income
HH_head_name
HH_address
HH_city
HH_state
HH_zip
HH_revenue
HH_acquisition_cost
HH_service_cost
HH_retention_cost
HH_marketing_budget

Account_key
Account_address
Account_city
Account_state
Account_zip
Account_SCF
Account_age
Date_opened
Primary_age
Primary_marital
Primary_sex
Primary_surname
Secondary_surname

Needs_key
Need_description
Household_member

Product_key
Category
Product_description
Type

Month_key
Fiscal_quarter
Month
Year

Branch_key
Branch_address
Branch_city
Branch_name
Branch_state
Branch_SCF

Demographic_key
Age_band
Children
Income_band
Marital_status
Sex
Race
Occupation
Homeowner
Moved_last_6_months

Status_key
Closed_account_flag
New_account_flag
Status_description
Status_reason

Customer_key
First_name
Last_name
SSN
Birthday
Status
Customer_revenue
Customer_acquisition_cost
Customer_service_cost
Customer_retention_cost
Customer_profitability*
Marketing_budget

Prospect_key
First_name
Last_name
SSN
Birthday
Status
Marketing_budget
Syndicated_data

Event_key
Event_type
Event_date
Household_member

Month_key
Account_key
Product_key
Branch_key
Household_key
Customer_key
Prospect_key
Demographic_key
Status_key
Checking_Accounts_key
Savings_Accounts_Regular_key
Savings_Accounts_IRA_key
CD_Regular_key
CD_IRA_key
Mortgage_key
Home_Equity_Line_key
Autoloan_key
Installment_loan_key
Line_of_Credit_key
Credit_card_key
Investments_Regular_key
Investments_IRA_key
Branch_Transactions_key
POS_Transactions_key
Wire_Transfers_key
Phone_Transactions_key
Mail_Transactions_key
PC_Transactions_key
ATM_Transactions_key
Credit_Card_Transactions_key
Events_key
Needs_key
Campaign_key
Promotional_history_key
Contact_history_key
FACTS IN EXCEL

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## Accounts

<b>Checking_Accounts_key</b> CA_date_opened CA_campaign_response_flag CA_channel_used CA_location_opened CA_initial_deposit CA_interest_rate CA_number_of overdraft_credit_line CA_overdraft_limit CA_number_of ATM_cards CA_stopped_checks_flag CA_returned_checks_flag CA_last overdraft_credit_limit_increased	<b>Savings_Accounts_Regular_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit interest_rate total_interest_paid annual_interest_paid overdraft_limit number_of ATM_cards overdrafts_flag automatic_deposits_flag automatic_withdrawal_flag automatic_transfers_flag fees_waived_flag charges_waived_flag	<b>Savings_Accounts_IRA_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit interest_rate annual_interest_paid total_interest_paid overdraft_limit number_of ATM_cards overdrafts_flag automatic_deposits_flag automatic_withdrawal_flag automatic_transfers_flag fees_waived_flag charges_waived_flag early_withdrawal_flag	<b>Credit_card_key</b> card_type expiration_date annual_fee_amount cc_VIP_account_flag cc_frequent_flier_member_flag last_card_mail_date cc_direct_mail_flag cc_telemarket_flag cc_annual_fee_amount cc_account_delinquency_flag cc_last_credit_line_increase cc_amount_of last_credit_line_increase cc_requested_last_credit_line_increase_flag initiated_balance_transfer_in_flag initiated_balance_transfer_out_flag cc_dropped_credit_card cc_stopped_credit_card_use
<b>CD_Regular_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit CD_term initial_deposit interest_rate months_until_maturity fees_waived_flag service_charges_waived_flag fees_paid service_charges_paid	<b>CD_IRA_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit CD_term initial_deposit interest_rate months_until_maturity fees_waived_flag service_charges_waived_flag fees_paid service_charges_paid early_withdrawal_flag	<b>Investments_Regular_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit gross_rate_of_return tax_benefit net_rate Investment_type Shares_held Investments_annual_fee_amount Investments_VIP_account_flag Investments_credit_line Investments_last_credit_line_increase Investments_amount_of_last_credit_line_increase Investments_requested_last_credit_line_increase_flag	<b>Investments_IRA_key</b> date_opened campaign_response_flag channel_used location_opened initial_deposit gross_rate_of_return tax_benefit net_rate Investment_type Shares_held Investments_annual_fee_amount Investments_VIP_account_flag Investments_credit_line Investments_last_credit_line_increase Investments_amount_of_last_credit_line_increase Investments_requested_last_credit_line_increase_flag fees_waived_flag service_charges_waived_flag early_withdrawal_flag

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## Loans (1)

<b>Autoloan_key</b> date_opened campaign_response_flag channel_used location_opened amount_borrowed interest_rate term months_to_maturity collateral_value monthly_payment automatic_payment_flag early_payment_flag payment_method 30_day_delinquency_flag 60_day_delinquency_flag 90_day_delinquency_flag 120+_day_delinquency_flag	<b>Mortgage_key</b> date_opened campaign_response_flag channel_used location_opened amount_borrowed interest_rate fixed_interest_rate_flag variable_interest_rate_flag term months_to_maturity mortgage_type first_mortgage_amount second_mortgage_amount collateral_value monthly_payment automatic_payment_flag early_payment_flag payment_method fees_waived_flag service_charges_waived_flag 30_day_delinquency_flag 60_day_delinquency_flag 90_day_delinquency_flag 120+_day_delinquency_flag credit_life_insurance_flag credit_life_insurance_amount	<b>Home_Equity_Line_key</b> date_opened campaign_response_flag channel_used location_opened amount_borrowed interest_rate fixed_interest_rate_flag variable_interest_rate_flag term months_to_maturity collateral_value monthly_payment automatic_payment_flag early_payment_flag payment_method fees_waived_flag service_charges_waived_flag 30_day_delinquency_flag 60_day_delinquency_flag 90_day_delinquency_flag 120+_day_delinquency_flag last_credit_line_increase amount_of_last_credit_line_increase requested_last_credit_line_increase_flag overlimits_flag overlimit_max_amount credit_life_insurance_flag credit_life_insurance_amount	<b>Installment_Loan_key</b> date_opened campaign_response_flag channel_used location_opened amount_borrowed interest_rate fixed_interest_rate_flag variable_interest_rate_flag term months_to_maturity collateral_value monthly_payment automatic_payment_flag early_payment_flag payment_method fees_waived_flag service_charges_waived_flag 30_day_delinquency_flag 60_day_delinquency_flag 90_day_delinquency_flag 120+_day_delinquency_flag last_credit_line_increase amount_of_last_credit_line_increase requested_last_credit_line_increase_flag overlimits_flag overlimit_max_amount credit_life_insurance_flag credit_life_insurance_amount
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## Loans (2)

Line_of_Credit_key
LOC_date_opened
LOC_campaign_response_flag
LOC_channel_used
LOC_location_opened
LOC_amount_borrowed
LOC_interest_rate
LOC_fixed_interest_rate_flag
LOC_variable_interest_rate_flag
LOC_term
LOC_credit_line_amount
LOC_annual_fee
LOC_months_until_renewal
LOC_collateral_value
LOC_monthly_payment
LOC_automatic_payment_flag
LOC_early_payment_flag
LOC_check_debits_flag
LOC_transfer_debits_flag
LOC_payment_method
LOC_fees_waived_flag
LOC_service_charges_waived_flag
LOC_30_day_delinquency_flag
LOC_60_day_delinquency_flag
LOC_90_day_delinquency_flag
LOC_120+_day_delinquency_flag
LOC_last_credit_line_increase
LOC_amount_of_last_credit_line_increase
LOC_requested_last_credit_line_increase_flag
LOC_overlimits_flag
LOC_overlimit_max_amount
LOC_credit_life_insurance_flag
LOC_credit_life_insurance_amount

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## Transactions

Branch_Transactions_key
transaction_id
type
amount
date
location
campaign_response_flag

ATM_Transactions_key
transaction_id
type
amount
date
location
message_displayed
campaign_response_flag

Credit_Card_Transactions_key
transaction_id
type
amount
date
location
product_purchased
business_type

POS_Transactions_key
transaction_id
type
amount
date
location
business_type

Phone_Transactions_key
transaction_id
type
amount
date

Mail_Transactions_key
transaction_id
type
amount
date
origin

PC_Transactions_key
transaction_id
type
amount
date
origin

Wire_Transfers_key
transaction_id
type
amount
date
origin

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## Campaigns

Campaign_key	Product_key	Promotional_history_key
Campaign_description	Product_type	Promotion_reason
Response_description	Last_promotion_date	Product_type
Start_date	Last_promotion_channel	Last_promotion_date
End_date	Last_promotion_resolution	Last_promotion_channel
Campaign_type (event, target, mkt)	Last_offer_accepted	Last_promotion_resolution
Campaign_priority	Last_offer_accepted_date	Last_offer_accepted
Campaign_target	Last_offer_accepted_channel	Last_offer_accepted_date
Campaign_offer		Last_offer_accepted_channel
Campaign_budget		
Targeted_population	Contact_history_key	
Number_of_cells	Last_contact_date	
Campaign_first_channel	Last_contact_reason	
FC_contact_date	Last_contact_channel	
FC_per_customer_cost	Last_contact_description	
Campaign_second_channel	Last_contact_product	
SC_contact_date	Last_contact_resolution	
SC_per_customer_cost	Contacts_teller_reason_in_last_3_months	
Campaign_third_channel	Contacts_teller_reason_in_last_6_months	
TC_contact_date	Contacts_teller_reason_in_last_12_months	
TC_per_customer_cost	Contacts_VRU_reason_in_last_3_months	
Response_channel	Contacts_VRU_reason_in_last_6_months	
Offered_accepted_date	Contacts_VRU_reason_in_last_12_months	
	Contacts_CSR_reason_in_last_3_months	
	Contacts_CSR_reason_in_last_6_months	
	Contacts_CSR_reason_in_last_12_months	
	Contacts_Web_reason_in_last_3_months	
	Contacts_Web_reason_in_last_6_months	
	Contacts_Web_reason_in_last_12_months	

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**Reports**

- Customer value trend
- Household value trend
- Cross sell report for account, household, region, and branch
- Household report
- Product report
- Account balance demographics by product
- Product activity by quarter
- Campaigns by month by geography
- Campaigns by month
- Campaign by geography
- Campaigns by household type
- Campaigns by risk level
- Campaign/offer by customer (by month, by quarter, by year)
- Campaign/offer by household (by month, by quarter, by year)
- Campaign by type by time (month, quarter, year)
- Campaigns by channel by time (month, quarter, year)
- Campaigns by channel by household (or by customer)
- Cost per contact
- Cost of campaign by cell by channel
- Campaign effectiveness by month
- Campaign response by cell
- Campaign response by geography
- Campaign response by channel

**Calculations**

Household\_profitability=Household\_revenue- $\sum_{\text{over all campaigns}} (\text{HH\_acquisition\_cost}+\text{HH\_service\_cost}+\text{HH\_retention\_cost})$

Customer\_profitability=Customer\_revenue- $\sum_{\text{over all campaigns}} (\text{Customer\_acquisition\_cost}+\text{Customer\_service\_cost}+\text{Customer\_retention\_cost})$

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## Fact Table

**Banking Model Measures**  
**Customer Analytics Inc.**  
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Primary\_balance  
 Branch\_transaction\_count\*  
 Branch\_transaction\_types  
 Avg\_branch\_transaction\_size\*  
 Most\_frequent\_branch\_transaction\_time\*  
 Most\_frequent\_branch\_transaction\_location\*  
 Days\_below\_min\_balance\*  
 Days\_overdrawn\*  
 num\_days\_since\_last\_payment\*  
 ratio\_payments\_to\_balance\*  
 ratio\_current\_balance\_to\_last\_year\_bal\*  
 HH\_relationship\_age  
 HH\_revenue  
 HH\_acquisition\_cost  
 HH\_service\_cost  
 HH\_retention\_cost  
 HH\_profitability\*  
 HH\_marketing\_budget  
 HH\_future\_profitability\_score  
 HH\_risk\_score  
 HH\_LTV\_score  
 HH\_attrition\_score  
 HH\_profitability\*  
 HH\_attitudinal\_segment  
 HH\_behavioral\_segment  
 HH\_lifestyle\_segment  
 HH\_actifity\_segment  
 HH\_attitudinal\_segment  
 HH\_behavioral\_segment  
 HH\_lifestyle\_segment  
 HH\_probability\_of\_accept\_CD\_offer  
 HH\_probability\_of\_accept\_IRA\_offer  
 HH\_probability\_of\_accept\_homeq\_offer  
 HH\_probability\_of\_accept\_savings\_offer  
 HH\_Max\_number\_of\_campaigns\*  
 HH\_Min\_number\_of\_campaigns\*  
 Customer\_relationship\_age  
 Customer\_acquisition\_cost  
 Customer\_service\_cost  
 Customer\_retention\_cost  
 Customer\_profitability\*  
 Customer\_marketing\_budget  
 Customer\_future\_profitability\_score  
 Customer\_risk\_score  
 Customer\_LTV\_score

## Fact Table

Customer\_attrition\_score  
 Customer\_attitudinal\_segment  
 Customer\_acquisition\_cost  
 Customer\_lifestyle\_segment  
 Customer\_activity\_segment  
 Customer\_needs\_segment  
 Customer\_adhoc\_segment  
 Customer\_probability\_of\_accept\_card\_offer  
 Customer\_probability\_of\_accept\_CD\_offer  
 Customer\_probability\_of\_accept\_IRA\_offer  
 Customer\_probability\_of\_accept\_homeq\_offer  
 Customer\_probability\_of\_accept\_savings\_offer  
 Customer\_Max\_number\_of\_campaigns\*  
 Customer\_Min\_number\_of\_campaigns\*  
 CC\_profit\_score  
 CC\_segmentation\_lifestyle\_score  
 CC\_segmentation\_behavior\_score  
 CC\_segmentation\_attitude\_score  
 CC\_segmentation\_activity\_score  
 CC\_attrition\_score  
 CC\_segmentation\_lifestyle\_score  
 CC\_segmentation\_behavior\_score  
 CC\_segmentation\_attitude\_score  
 CC\_segmentation\_activity\_score

**Accounts**

Number of Accounts

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Accounts

**Balance**

## Fact Table

Net Balance (Deposits - Loans)

**Transactions (Credits + Debits)**

Business Volume (Deposits + Loans)

Number of Transactions

Transaction Volume

Transaction Size

**Credits**

Number of Credits

Credit Volume

Credit Size

Number of Credits as a % of Number of Transactions

Credit Volume as a % of Transaction Volume

Credit Volume as a % of Business Volume

**Debits**

Number of Debits

Debit Volume

Debit Size

Debit Number of as a % of Number of Transactions

Debit Volume as a % of Transaction Volume

Debit Volume as a % of Business Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Number of Transactions

Fee/Service Charge Volume as a % of Transaction Volume

Fee/Service Charge Volume as a % of Business Volume

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Number of Transactions

Fee/Service Charge Waived Volume as a % of Transaction Volume

Fee/Service Charge Waived Volume as a % of Business Volume

**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Total Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

## Fact Table

Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Interest Rate Deposits**

Number of Deposits  
 Deposit Volume  
 Deposit Size  
 Number of Deposits as a % of Total Transactions  
 Deposit Volume as a % of Total Transaction Volume  
 Deposit Volume as a % of Balance

**Cash Deposits**

Number of Cash Deposits  
 Cash Deposit Volume  
 Cash Deposit Size  
 Cash Deposit Number of as a % of Deposit Number of  
 Cash Deposit Volume as a % of Deposit Volume

**Check Deposits**

Number of Check Deposits  
 Check Deposit Volume  
 Check Deposit Size  
 Check Deposits Number of as a % of Deposits Number of  
 Check Deposit Volume as a % of Deposit Volume

**Transfer Deposits**

Number of Transfer Deposits  
 Transfer Deposit Volume  
 Transfer Deposit Size  
 Transfer Deposit Number of as a % of Deposit Number of  
 Transfer Deposit Volume as a % of Deposit Volume

**Direct Deposits**

Number of Direct Deposits  
 Direct Deposit Volume  
 Direct Deposit Size  
 Direct Deposit Number of as a % of Deposit Number of  
 Direct Deposit Volume as a % of Deposit Volume

**POS Credits**

Number of POS Credits  
 POS Credit Volume  
 POS Credit Size  
 POS Credit Number of as a % of Deposit Number of  
 POS Credit Volume as a % of Deposit Volume

**Withdrawals**

Number of Withdrawals  
 Withdrawal Volume  
 Withdrawal Size  
 Withdrawal Number of as a % of Total Transactions  
 Withdrawal Volume as a % of Total Transaction Volume  
 Withdrawal Volume as a % of Balance

**Cash Withdrawals**

## Fact Table

Number of Cash Withdrawals

Cash Withdrawal Volume

Cash Withdrawal Size

Cash Withdrawal Number of as a % of Withdrawal Number of

Cash Withdrawal Volume as a % of Withdrawal Volume

**Check Withdrawals**

Number of Check Withdrawals

Check Withdrawal Volume

Check Withdrawal Size

Check Withdrawal Number of as a % of Withdrawal Number of

Check Withdrawal Volume as a % of Withdrawal Volume

**Transfer Withdrawals**

Number of Transfer Withdrawals

Transfer Withdrawal Volume

Transfer Withdrawal Size

Transfer Withdrawal Number of as a % of Withdrawal Number of

Transfer Withdrawal Volume as a % of Withdrawal Volume

**Direct Debits**

Number of Direct Debits

Direct Debit Volume

Direct Debit Size

Direct Debit Number of as a % of Withdrawal Number of

Direct Debit Volume as a % of Withdrawal Volume

**POS Debits**

Number of POS Debits

POS Debit Volume

POS Debit Size

POS Debit Number of as a % of Withdrawal Number of

POS Debit Volume as a % of Withdrawal Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Accounts**

Number of Accounts

## Fact Table

Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Interest Rate**  
**Overdraft Credit Line**  
 Number of Overdraft Credit Lines  
 Percentage of Checking Accounts covered by Overdraft Line  
 Total Line Size of Overdraft Credit Line  
 Average Line Size of Overdraft Credit Line  
**ATM Cards**  
 Number of ATM Cards  
 Percentage of Accounts linked with ATM Card(s)  
 Percentage of Account Balances linked with ATM Card(s)  
**Deposits**  
 Number of Deposits  
 Deposit Volume  
 Deposit Size  
 Number of Deposits as a % of Total Transactions  
 Deposit Volume as a % of Total Transaction Volume  
 Deposit Volume as a % of Balance  
**Cash Deposits**  
 Number of Cash Deposits  
 Cash Deposit Volume  
 Cash Deposit Size  
 Cash Deposit Number of as a % of Deposit Number of  
 Cash Deposit Volume as a % of Deposit Volume  
**Check Deposits**  
 Number of Check Deposits  
 Check Deposit Volume  
 Check Deposit Size  
 Check Deposits Number of as a % of Deposits Number of  
 Check Deposit Volume as a % of Deposit Volume  
**Transfer Deposits**  
 Number of Transfer Deposits  
 Transfer Deposit Volume  
 Transfer Deposit Size  
 Transfer Deposit Number of as a % of Deposit Number of  
 Transfer Deposit Volume as a % of Deposit Volume  
**Direct Deposits**  
 Number of Direct Deposits

## Fact Table

Direct Deposit Volume  
Direct Deposit Size  
Direct Deposit Number of as a % of Deposit Number of  
Direct Deposit Volume as a % of Deposit Volume  
**POS Credits**  
Number of POS Credits  
POS Credit Volume  
POS Credit Size  
POS Credit Number of as a % of Deposit Number of  
POS Credit Volume as a % of Deposit Volume  
**Withdrawals**  
Number of Withdrawals  
Withdrawal Volume  
Withdrawal Size  
Withdrawal Number of as a % of Total Transactions  
Withdrawal Volume as a % of Total Transaction Volume  
Withdrawal Volume as a % of Balance  
**Cash Withdrawals**  
Number of Cash Withdrawals  
Cash Withdrawal Volume  
Cash Withdrawal Size  
Cash Withdrawal Number of as a % of Withdrawal Number of  
Cash Withdrawal Volume as a % of Withdrawal Volume  
**Check Withdrawals**  
Number of Check Withdrawals  
Check Withdrawal Volume  
Check Withdrawal Size  
Check Withdrawal Number of as a % of Withdrawal Number of  
Check Withdrawal Volume as a % of Withdrawal Volume  
**Transfer Withdrawals**  
Number of Transfer Withdrawals  
Transfer Withdrawal Volume  
Transfer Withdrawal Size  
Transfer Withdrawal Number of as a % of Withdrawal Number of  
Transfer Withdrawal Volume as a % of Withdrawal Volume  
**Direct Debits**  
Number of Direct Debits  
Direct Debit Volume  
Direct Debit Size  
Direct Debit Number of as a % of Withdrawal Number of  
Direct Debit Volume as a % of Withdrawal Volume  
**POS Debits**  
Number of POS Debits  
POS Debit Volume  
POS Debit Size  
POS Debit Number of as a % of Withdrawal Number of  
POS Debit Volume as a % of Withdrawal Volume  
**Stopped Checks**  
Number of Stopped Checks

## Fact Table

Stopped Check Volume  
 Stopped Check Size  
 Stopped Checks as a % of Total Checks  
 Stopped Check Volume as a % of Total Check Volume  
**Returned Checks**  
 Number\_of\_Returned\_Checks  
 Returned Check Volume  
 Returned Check Size  
 Returned Checks as a % of Total Checks  
 Returned Check Volume as a % of Total Check Volume  
**Overdrafts**  
 Number of Overdrafts  
 Overdraft Volume  
 Overdraft Size  
 Overdrafts as a % of Total Checks  
 Overdraft Volume as a % of Total Check Volume  
**Fees and Service Charges**  
 Number of Fees/Service Charges  
 Fee/Service Charge Volume  
 Average Fee/Service Charge Size  
 Fee/Service Charge Number of as a % of Total Transaction Number of  
 Fee/Service Charge Volume as a % of Total Transaction Volume  
 Fee/Service Charge Volume as a % of Balance  
**Fees and Service Charges Waived**  
 Number of Fees/Service Charges Waived  
 Fee/Service Charge Waived Volume  
 Average Fee/Service Charge Waived Size  
 Fee/Service Charge Waived Number of as a % of Total Transaction Number of  
 Fee/Service Charge Waived Volume as a % of Total Transaction Volume  
 Fee/Service Charge Waived Volume as a % of Balance

### Assets, Liabilities, and Equity

#### Accounts

Number of Accounts  
 Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Interest Rate**

## Fact Table

**ATM Cards**

Number of ATM Cards

Percentage of Accounts linked with ATM Card(s)

Percentage of Account Balances linked with ATM Card(s)

**Deposits**

Number of Deposits

Deposit Volume

Deposit Size

Number of Deposits as a % of Total Transactions

Deposit Volume as a % of Total Transaction Volume

Deposit Volume as a % of Balance

**Cash Deposits**

Number of Cash Deposits

Cash Deposit Volume

Cash Deposit Size

Cash Deposit Number of as a % of Deposit Number of

Cash Deposit Volume as a % of Deposit Volume

**Check Deposits**

Number of Check Deposits

Check Deposit Volume

Check Deposit Size

Check Deposits Number of as a % of Deposits Number of

Check Deposit Volume as a % of Deposit Volume

**Transfer Deposits**

Number of Transfer Deposits

Transfer Deposit Volume

Transfer Deposit Size

Transfer Deposit Number of as a % of Deposit Number of

Transfer Deposit Volume as a % of Deposit Volume

**Direct Deposits**

Number of Direct Deposits

Direct Deposit Volume

Direct Deposit Size

Direct Deposit Number of as a % of Deposit Number of

Direct Deposit Volume as a % of Deposit Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Deposit Number of

POS Credit Volume as a % of Deposit Volume

**Withdrawals**

Number of Withdrawals

Withdrawal Volume

Withdrawal Size

Withdrawal Number of as a % of Total Transactions

Withdrawal Volume as a % of Total Transaction Volume

Withdrawal Volume as a % of Balance

**Cash Withdrawals**

## Fact Table

Number of Cash Withdrawals

Cash Withdrawal Volume

Cash Withdrawal Size

Cash Withdrawal Number of as a % of Withdrawal Number of

Cash Withdrawal Volume as a % of Withdrawal Volume

**Check Withdrawals**

Number of Check Withdrawals

Check Withdrawal Volume

Check Withdrawal Size

Check Withdrawal Number of as a % of Withdrawal Number of

Check Withdrawal Volume as a % of Withdrawal Volume

**Transfer Withdrawals**

Number of Transfer Withdrawals

Transfer Withdrawal Volume

Transfer Withdrawal Size

Transfer Withdrawal Number of as a % of Withdrawal Number of

Transfer Withdrawal Volume as a % of Withdrawal Volume

**Direct Debits**

Number of Direct Debits

Direct Debit Volume

Direct Debit Size

Direct Debit Number of as a % of Withdrawal Number of

Direct Debit Volume as a % of Withdrawal Volume

**POS Debits**

Number of POS Debits

POS Debit Volume

POS Debit Size

POS Debit Number of as a % of Withdrawal Number of

POS Debit Volume as a % of Withdrawal Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Accounts**

**Accounts**

Number of Accounts

## Fact Table

Balance  
Average Balance  
Number of Accounts as a % of Total Accounts  
Balance as a % of Total Balance  
**Account Openings**  
Number of Account Openings  
Number of Account Openings as a % Total Account Openings  
Number of Account Openings as a % Total Accounts  
**Account Closings**  
Number of Account Closings  
Number of Account Closings as a % Total Account Closings  
Number of Account Closings as a % Total Accounts  
**Interest Rate**  
**ATM Cards**  
Number of ATM Cards  
Percentage of Accounts linked with ATM Card(s)  
Percentage of Account Balances linked with ATM Card(s)  
**Deposits**  
Number of Deposits  
Deposit Volume  
Deposit Size  
Number of Deposits as a % of Total Transactions  
Deposit Volume as a % of Total Transaction Volume  
Deposit Volume as a % of Balance  
**Cash Deposits**  
Number of Cash Deposits  
Cash Deposit Volume  
Cash Deposit Size  
Cash Deposit Number of as a % of Deposit Number of  
Cash Deposit Volume as a % of Deposit Volume  
**Check Deposits**  
Number of Check Deposits  
Check Deposit Volume  
Check Deposit Size  
Check Deposits Number of as a % of Deposits Number of  
Check Deposit Volume as a % of Deposit Volume  
**Transfer Deposits**  
Number of Transfer Deposits  
Transfer Deposit Volume  
Transfer Deposit Size  
Transfer Deposit Number of as a % of Deposit Number of  
Transfer Deposit Volume as a % of Deposit Volume  
**Direct Deposits**  
Number of Direct Deposits  
Direct Deposit Volume  
Direct Deposit Size  
Direct Deposit Number of as a % of Deposit Number of  
Direct Deposit Volume as a % of Deposit Volume  
**POS Credits**

## Fact Table

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Deposit Number of

POS Credit Volume as a % of Deposit Volume

**Withdrawals**

Number of Withdrawals

Withdrawal Volume

Withdrawal Size

Withdrawal Number of as a % of Total Transactions

Withdrawal Volume as a % of Total Transaction Volume

Withdrawal Volume as a % of Balance

**Cash Withdrawals**

Number of Cash Withdrawals

Cash Withdrawal Volume

Cash Withdrawal Size

Cash Withdrawal Number of as a % of Withdrawal Number of

Cash Withdrawal Volume as a % of Withdrawal Volume

**Check Withdrawals**

Number of Check Withdrawals

Check Withdrawal Volume

Check Withdrawal Size

Check Withdrawal Number of as a % of Withdrawal Number of

Check Withdrawal Volume as a % of Withdrawal Volume

**Transfer Withdrawals**

Number of Transfer Withdrawals

Transfer Withdrawal Volume

Transfer Withdrawal Size

Transfer Withdrawal Number of as a % of Withdrawal Number of

Transfer Withdrawal Volume as a % of Withdrawal Volume

**Direct Debits**

Number of Direct Debits

Direct Debit Volume

Direct Debit Size

Direct Debit Number of as a % of Withdrawal Number of

Direct Debit Volume as a % of Withdrawal Volume

**POS Debits**

Number of POS Debits

POS Debit Volume

POS Debit Size

POS Debit Number of as a % of Withdrawal Number of

POS Debit Volume as a % of Withdrawal Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

## Fact Table

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Total Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Interest Rate**

Term

Months Until Maturity

Percentage Auto Renewal

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Accounts**

Number of Accounts

## Fact Table

Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Interest Rate**  
**Term**  
**Months Until Maturity**  
**Percentage Auto Renewal**  
**Fees and Service Charges**  
 Number of Fees/Service Charges  
 Fee/Service Charge Volume  
 Average Fee/Service Charge Size  
 Fee/Service Charge Number of as a % of Total Transaction Number of  
 Fee/Service Charge Volume as a % of Total Transaction Volume  
 Fee/Service Charge Volume as a % of Balance  
**Fees and Service Charges Waived**  
 Number of Fees/Service Charges Waived  
 Fee/Service Charge Waived Volume  
 Average Fee/Service Charge Waived Size  
 Fee/Service Charge Waived Number of as a % of Total Transaction Number of  
 Fee/Service Charge Waived Volume as a % of Total Transaction Volume  
 Fee/Service Charge Waived Volume as a % of Balance



**Accounts**  
 Number of Accounts  
 Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Rate of Return**

## Fact Table

Gross Rate  
 Tax Benefit  
 Net Rate  
**Investment Mix**  
**Bonds**  
 Government  
 Corporate  
**Mutual Funds**  
 Government Bond  
 Corporate Bond  
 Blue Chip  
 Mid-Cap  
 Small-Cap  
 Technology  
 Transportation  
 Health Care  
 Other Sector  
 International  
**Stocks**  
 Blue Chip  
 Mid-Cap  
 Small-Cap  
 Technology  
 Transportation  
 Health Care  
 Other Sector  
 International  
**Other**  
**Trades**  
 Number of Trades  
 Trade Volume  
 Trade Size  
 Number of Trades as a % of Total Transactions  
 Trade Volume as a % of Total Transaction Volume  
 Trade Volume as a % of Balance  
**ATM Cards**  
 Number of ATM Cards  
 Percentage of Accounts linked with ATM Card(s)  
 Percentage of Account Balances linked with ATM Card(s)  
**Deposits**  
 Number of Deposits  
 Deposit Volume  
 Deposit Size  
 Number of Deposits as a % of Total Transactions  
 Deposit Volume as a % of Total Transaction Volume  
 Deposit Volume as a % of Balance  
**Cash Deposits**  
 Number of Cash Deposits  
 Cash Deposit Volume

## Fact Table

Cash Deposit Size

Cash Deposit Number of as a % of Deposit Number of

Cash Deposit Volume as a % of Deposit Volume

**Check Deposits**

Number of Check Deposits

Check Deposit Volume

Check Deposit Size

Check Deposits Number of as a % of Deposits Number of

Check Deposit Volume as a % of Deposit Volume

**Transfer Deposits**

Number of Transfer Deposits

Transfer Deposit Volume

Transfer Deposit Size

Transfer Deposit Number of as a % of Deposit Number of

Transfer Deposit Volume as a % of Deposit Volume

**Direct Deposits**

Number of Direct Deposits

Direct Deposit Volume

Direct Deposit Size

Direct Deposit Number of as a % of Deposit Number of

Direct Deposit Volume as a % of Deposit Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Deposit Number of

POS Credit Volume as a % of Deposit Volume

**Withdrawals**

Number of Withdrawals

Withdrawal Volume

Withdrawal Size

Withdrawal Number of as a % of Total Transactions

Withdrawal Volume as a % of Total Transaction Volume

Withdrawal Volume as a % of Balance

**Cash Withdrawals**

Number of Cash Withdrawals

Cash Withdrawal Volume

Cash Withdrawal Size

Cash Withdrawal Number of as a % of Withdrawal Number of

Cash Withdrawal Volume as a % of Withdrawal Volume

**Check Withdrawals**

Number of Check Withdrawals

Check Withdrawal Volume

Check Withdrawal Size

Check Withdrawal Number of as a % of Withdrawal Number of

Check Withdrawal Volume as a % of Withdrawal Volume

**Transfer Withdrawals**

Number of Transfer Withdrawals

Transfer Withdrawal Volume

## Fact Table

Transfer Withdrawal Size  
 Transfer Withdrawal Number of as a % of Withdrawal Number of  
 Transfer Withdrawal Volume as a % of Withdrawal Volume  
**Direct Debits**  
 Number of Direct Debits  
 Direct Debit Volume  
 Direct Debit Size  
 Direct Debit Number of as a % of Withdrawal Number of  
 Direct Debit Volume as a % of Withdrawal Volume  
**POS Debits**  
 Number of POS Debits  
 POS Debit Volume  
 POS Debit Size  
 POS Debit Number of as a % of Withdrawal Number of  
 POS Debit Volume as a % of Withdrawal Volume  
**Fees and Service Charges**  
 Number of Fees/Service Charges  
 Fee/Service Charge Volume  
 Average Fee/Service Charge Size  
 Fee/Service Charge Number of as a % of Total Transaction Number of  
 Fee/Service Charge Volume as a % of Total Transaction Volume  
 Fee/Service Charge Volume as a % of Balance  
**Fees and Service Charges Waived**  
 Number of Fees/Service Charges Waived  
 Fee/Service Charge Waived Volume  
 Average Fee/Service Charge Waived Size  
 Fee/Service Charge Waived Number of as a % of Total Transaction Number of  
 Fee/Service Charge Waived Volume as a % of Total Transaction Volume  
 Fee/Service Charge Waived Volume as a % of Balance



**Accounts**  
 Number of Accounts  
 Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Rate of Return**  
 Gross Rate

## Fact Table

Tax Benefit  
 Net Rate  
**Investment Mix**  
**Bonds**  
 Government  
 Corporate  
**Mutual Funds**  
 Government Bond  
 Corporate Bond  
 Blue Chip  
 Mid-Cap  
 Small-Cap  
 Technology  
 Transportation  
 Health Care  
 Other Sector  
 International  
**Stocks**  
 Blue Chip  
 Mid-Cap  
 Small-Cap  
 Technology  
 Transportation  
 Health Care  
 Other Sector  
 International  
**Other**  
**Trades**  
 Number of Trades  
 Trade Volume  
 Trade Size  
 Number of Trades as a % of Total Transactions  
 Trade Volume as a % of Total Transaction Volume  
 Trade Volume as a % of Balance  
**ATM Cards**  
 Number of ATM Cards  
 Percentage of Accounts linked with ATM Card(s)  
 Percentage of Account Balances linked with ATM Card(s)  
**Deposits**  
 Number of Deposits  
 Deposit Volume  
 Deposit Size  
 Number of Deposits as a % of Total Transactions  
 Deposit Volume as a % of Total Transaction Volume  
 Deposit Volume as a % of Balance  
**Cash Deposits**  
 Number of Cash Deposits  
 Cash Deposit Volume  
 Cash Deposit Size

## Fact Table

Cash Deposit Number of as a % of Deposit Number of  
 Cash Deposit Volume as a % of Deposit Volume

**Check Deposits**

Number of Check Deposits

Check Deposit Volume

Check Deposit Size

Check Deposits Number of as a % of Deposits Number of

Check Deposit Volume as a % of Deposit Volume

**Transfer Deposits**

Number of Transfer Deposits

Transfer Deposit Volume

Transfer Deposit Size

Transfer Deposit Number of as a % of Deposit Number of

Transfer Deposit Volume as a % of Deposit Volume

**Direct Deposits**

Number of Direct Deposits

Direct Deposit Volume

Direct Deposit Size

Direct Deposit Number of as a % of Deposit Number of

Direct Deposit Volume as a % of Deposit Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Deposit Number of

POS Credit Volume as a % of Deposit Volume

**Withdrawals**

Number of Withdrawals

Withdrawal Volume

Withdrawal Size

Withdrawal Number of as a % of Total Transactions

Withdrawal Volume as a % of Total Transaction Volume

Withdrawal Volume as a % of Balance

**Cash Withdrawals**

Number of Cash Withdrawals

Cash Withdrawal Volume

Cash Withdrawal Size

Cash Withdrawal Number of as a % of Withdrawal Number of

Cash Withdrawal Volume as a % of Withdrawal Volume

**Check Withdrawals**

Number of Check Withdrawals

Check Withdrawal Volume

Check Withdrawal Size

Check Withdrawal Number of as a % of Withdrawal Number of

Check Withdrawal Volume as a % of Withdrawal Volume

**Transfer Withdrawals**

Number of Transfer Withdrawals

Transfer Withdrawal Volume

Transfer Withdrawal Size

## Fact Table

Transfer Withdrawal Number of as a % of Withdrawal Number of  
 Transfer Withdrawal Volume as a % of Withdrawal Volume

**Direct Debits**

Number of Direct Debits

Direct Debit Volume

Direct Debit Size

Direct Debit Number of as a % of Withdrawal Number of

Direct Debit Volume as a % of Withdrawal Volume

**POS Debits**

Number of POS Debits

POS Debit Volume

POS Debit Size

POS Debit Number of as a % of Withdrawal Number of

POS Debit Volume as a % of Withdrawal Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Total Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Interest Rate**

Fixed

## Fact Table

Variable

**Contract Amount**

Contract Amount

Contract Amount as a % of Total Exposure

**Term****Months to Maturity****Collateral (Secured Loans)**

Collateral Value

Collateral as a % of Balance

Collateral as a % of Contract Amount

**Credit Line (Lines of Credit)**

Total Line

Average Line

Line as a % of Total Exposure

**Line Increase (Lines of Credit)****Utilization (Lines of Credit)**

Number of Line Increases

Line Increase Volume

Average Line Increase

Number of Line Increases as a % of Accounts

Line Increase Volume as a % of Line

**Utilization (Lines of Credit)**

Utilization Rate

Average Utilization

Utilization as a % of Total Utilization

**Payments**

Number of Payments

Payment Volume

Average Payment Size

Number of Payments per Account

Payment Volume as a % of Minimum Amount Due

Payment Volume as a % of Balance

Payment Volume as a % of Total Payment Volume

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

## Fact Table

Transfer Payment Volume as a % of Payment Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Payment Number of

POS Credit Volume as a % of Payment Volume

**Debits (Lines of Credit)**

Number of Debits

Debit Volume

Average Debit Size

Number of Debits per Account

Debit Volume as a % of Line

Debit Volume as a % of Balance

Debit Volume as a % of Total Debit Volume

**Cash Debits (Lines of Credit)**

Number of Cash Debits

Cash Debit Volume

Cash Debit Size

Cash Debit Number of as a % of Debit Number of

Cash Debit Volume as a % of Debit Volume

**Merchandise POS Debits (Lines of Credit)**

Number of POS Debits

POS Debit Volume

POS Debit Size

POS Debit Number of as a % of Debit Number of

POS Debit Volume as a % of Debit Volume

**Check Debits (Lines of Credit)**

Number of Check Debits

Check Debit Volume

Check Debit Size

Check Debit Number of as a % of Debit Number of

Check Debit Volume as a % of Debit Volume

**Transfer Debits (Lines of Credit)**

Number of Transfer Debits

Transfer Debit Volume

Transfer Debit Size

Transfer Debit Number of as a % of Debit Number of

Transfer Debit Volume as a % of Debit Volume

**Fees and Service Charge Debits**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Debits Number of

Fee/Service Charge Volume as a % of Debit Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

## Fact Table

Average Fee/Service Charge Waived Size  
Fee/Service Charge Waived Number of as a % of Debit Number of  
Fee/Service Charge Waived Volume as a % of Debit Volume  
Fee/Service Charge Waived Volume as a % of Balance  
**Overlimits (Lines of Credit)**  
Number of Overlimits  
Overlimit Volume  
Average Overlimit  
Number of Overlimits as a % of Accounts  
Overlimit Volume as a % of Line  
**30 Day Delinquency**  
Number of Accounts  
Balances  
Average Balance  
Number of Accounts as a % of Total Accounts  
Balances as a % of Total Balance  
Utilization Rate  
**60 Day Delinquency**  
Number of Accounts  
Balances  
Average Balance  
Number of Accounts as a % of Total Accounts  
Balances as a % of Total Balance  
Utilization Rate  
**90 Day Delinquency**  
Number of Accounts  
Balances  
Average Balance  
Number of Accounts as a % of Total Accounts  
Balances as a % of Total Balance  
Utilization Rate  
**120 + Day Delinquency**  
Number of Accounts  
Balances  
Average Balance  
Number of Accounts as a % of Total Accounts  
Balances as a % of Total Balance  
Utilization Rate  
**Behavior Score**  
**Line Increase Requests (Lines of Credit)**  
Number of Increase Requests  
Amount Requested  
% Increase Requests Granted  
% Amount Requested Granted  
% Increase Requests Declined

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## Fact Table

**Accounts**

Number of Accounts

Balance

Average Balance

Equity

Number of Accounts as a % of Total Accounts

Balance as a % of Contract Amount

Balance as a % of Total Loan Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Contract Amount**

Contract Amount

Contract Amount as a % of Total Exposure

**Term****Months to Maturity****Collateral**

Collateral Value

Collateral as a % of Balance

Collateral as a % of Contract Amount

**Interest Rate**

Fixed

Variable

**Payments**

Number of Payments

Payment Volume

Average Payment Size

Number of Payments per Account

Minimum Payment Amount

Payment Volume as a % of Minimum Amount Due

Payment Volume as a % of Balance

Payment Volume as a % of Total Payment Volume

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

## Fact Table

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**Fees and Service Charge Debits**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Debits Number of

Fee/Service Charge Volume as a % of Debit Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Debit Number of

Fee/Service Charge Waived Volume as a % of Debit Volume

Fee/Service Charge Waived Volume as a % of Balance

**30 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**60 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**90 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**120 + Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**Behavior Score**


## Fact Table

**Credit Life Insurance**

Number of Accounts Covered

% of Accounts Covered

% of Balances Covered


**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Total Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Interest Rate**

Fixed

Variable

**Collateral (Equity)**

Collateral Value

Collateral as a % of Balance

Collateral as a % of Credit Line

**Credit Line**

Total Line

Average Line

Line as a % of Total Exposure

**Line Increase**

Number of Line Increases

Line Increase Volume

Average Line Increase

Number of Line Increases as a % of Accounts

Line Increase Volume as a % of Line

**Utilization**

Utilization Rate

Average Utilization

Utilization as a % of Total Utilization

**Payments**

Number of Payments

Payment Volume

Average Payment Size

Number of Payments per Account

Payment Volume as a % of Minimum Amount Due

Payment Volume as a % of Balance

Payment Volume as a % of Total Payment Volume

## Fact Table

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Payment Number of

POS Credit Volume as a % of Payment Volume

**Debits**

Number of Debits

Debit Volume

Average Debit Size

Number of Debits per Account

Debit Volume as a % of Line

Debit Volume as a % of Balance

Debit Volume as a % of Total Debit Volume

**Check Debits**

Number of Check Debits

Check Debit Volume

Check Debit Size

Check Debit Number of as a % of Debit Number of

Check Debit Volume as a % of Debit Volume

**Fees and Service Charge Debits**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Debits Number of

Fee/Service Charge Volume as a % of Debit Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

## Fact Table

Fee/Service Charge Waived Number of as a % of Debit Number of

Fee/Service Charge Waived Volume as a % of Debit Volume

Fee/Service Charge Waived Volume as a % of Balance

**Overlimits**

Number of Overlimits

Overlimit Volume

Average Overlimit

Number of Overlimits as a % of Accounts

Overlimit Volume as a % of Line

**30 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**60 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**90 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**120 + Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**Behavior Score**

**Line Increase Requests**

Number of Increase Requests

Amount Requested

% Increase Requests Granted

% Amount Requested Granted

% Increase Requests Declined

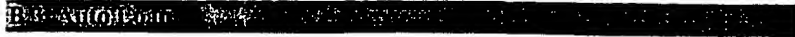
**Credit Life Insurance**

Number of Accounts Covered

% of Accounts Covered

% of Balances Covered

## Fact Table

**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Contract Amount

Balance as a % of Total Loan Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Contract Amount**

Contract Amount

Contract Amount as a % of Total Exposure

**Term**

Months to Maturity

**Collateral**

Collateral Value

Collateral as a % of Balance

Collateral as a % of Contract Amount

**Interest Rate**

Fixed

Variable

**Payments**

Number of Payments

Payment Volume

Average Payment Size

Number of Payments per Account

Minimum Payment Amount

Payment Volume as a % of Minimum Amount Due

Payment Volume as a % of Balance

Payment Volume as a % of Total Payment Volume

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

## Fact Table

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**Fees and Service Charge Debits**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Debits Number of

Fee/Service Charge Volume as a % of Debit Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Debit Number of

Fee/Service Charge Waived Volume as a % of Debit Volume

Fee/Service Charge Waived Volume as a % of Balance

**30 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**60 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**90 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**120 + Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

## Fact Table

Utilization Rate  
**Behavior Score**  
**Credit Life Insurance**  
 Number of Accounts Covered  
 % of Accounts Covered  
 % of Balances Covered



**Accounts**  
 Number of Accounts  
 Balance  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Contract Amount  
 Balance as a % of Total Loan Balance  
**Account Openings**  
 Number of Account Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
**Account Closings**  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
**Contract Amount**  
 Contract Amount  
 Contract Amount as a % of Total Exposure  
**Term**  
**Months to Maturity**  
**Collateral**  
 Collateral Value  
 Collateral as a % of Balance  
 Collateral as a % of Contract Amount  
**Interest Rate**  
 Fixed  
 Variable  
**Payments**  
 Number of Payments  
 Payment Volume  
 Average Payment Size  
 Number of Payments per Account  
 Minimum Payment Amount  
 Payment Volume as a % of Minimum Amount Due  
 Payment Volume as a % of Balance  
 Payment Volume as a % of Total Payment Volume  
**Cash Payments**  
 Number of Cash Payments  
 Cash Payment Volume

## Fact Table

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**Fees and Service Charge Debits**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Debits Number of

Fee/Service Charge Volume as a % of Debit Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Debit Number of

Fee/Service Charge Waived Volume as a % of Debit Volume

Fee/Service Charge Waived Volume as a % of Balance

**30 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**60 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**90 Day Delinquency**

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

## Fact Table

Utilization Rate  
 120 + Day Delinquency  
 Number of Accounts  
 Balances  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balances as a % of Total Balance  
 Utilization Rate  
 Behavior Score  
 Credit Life Insurance  
 Number of Accounts Covered  
 % of Accounts Covered  
 % of Balances Covered



Accounts  
 Number\_of\_Accounts  
 Balance  
 cc\_Total\_Months\_Zero\_Balance  
 cc\_Total\_Months\_Zero\_Spending  
 cc\_Average\_Balance  
 Number of Accounts as a % of Total Accounts  
 Balance as a % of Total Balance  
 CC\_number\_of\_inquiries\_last\_6\_months  
 CC\_interest\_paid\_in\_last\_6\_months  
 CC\_over\_limit\_fee\_amount\_in\_last\_6\_months  
 CC\_late\_fee\_amount\_paid\_in\_last\_6\_months  
 CC\_Number\_of\_Retail\_Transactions\_Last\_6\_Months  
 CC\_Number\_of\_Travel\_Transactions\_Last\_6\_Months  
 CC\_Number\_of\_Restaurant\_Transactions\_Last\_6\_Months  
 CC\_Number\_Cash\_Advance\_Transactions\_Last\_6\_Months  
 CC\_Total\_Retail\_Transactions\_Amount\_Last\_6\_Months  
 CC\_Total\_Travel\_Transactions\_Amount\_Last\_6\_Months  
 CC\_Total\_Restaurant\_Transactions\_Amount\_Last\_6\_Months  
 CC\_Total\_Cash\_Advance\_Transactions\_Amount\_Last\_6\_Months  
 CC\_Total\_Cash\_Advance\_Fee\_Amount\_Last\_6\_Months  
 Account Openings  
 Number\_of\_Account\_Openings  
 Number of Account Openings as a % Total Account Openings  
 Number of Account Openings as a % Total Accounts  
 Number\_of\_months\_since\_first\_opening  
 Number\_of\_months\_since\_last\_opening  
 Account Closings  
 Number of Account Closings  
 Number of Account Closings as a % Total Account Closings  
 Number of Account Closings as a % Total Accounts  
 Interest Rate

## Fact Table

Cash Rate  
 Merchandise Rate  
**Credit Line**  
 cc\_Total\_Line  
 Average Line  
 Line as a % of Total Exposure  
 Number of Line Increases  
 Line Increase Volume  
 Average Line Increase  
 Number of Line Increases as a % of Accounts  
 Line Increase Volume as a % of Line  
**Utilization**  
 cc\_Utilization\_Rate  
 cc\_Average\_Utilization  
 Utilization as a % of Total Utilization  
 cc\_Total\_Months\_Zero\_Utilization  
**Number of Cards**  
 Number of Cards  
 Average Number of Cards  
**Annual Fee**  
 Fee  
 Average Fee  
**Months Until Renewal**  
 No Fee Accounts  
 Fee Accounts  
**Payments**  
 Number\_of\_Payments  
 Payment\_Volume  
 Months\_of\_Zero\_Payments  
 Months\_of\_Full\_Payment  
 Average\_Payment\_Size  
 Number\_of\_Payments\_per\_Account  
 Payment\_Volume\_as\_Percent\_Minimum\_Amount\_Due  
 Payment\_Volume\_as\_Percent\_of\_Balance  
 Payment\_Volume\_as\_Percent\_of\_Total\_Payment\_Volume  
**Cash Payments**  
 Number\_of\_Cash\_Payments  
 Cash\_Payment\_Volume  
 Cash\_Payment\_Size  
 Cash\_Payment\_Number\_Percent\_of\_Payment\_Number  
 Cash\_Payment\_Volume\_as\_Percent\_of\_Payment\_Volume  
**Check Payments**  
 Number\_of\_Check\_Payments  
 Check\_Payment\_Volume  
 CC\_number\_of\_returned\_checks\_in\_last\_6\_months  
 Check\_Payment\_Size  
 Check\_Payments\_Number\_as\_Percent\_of\_Payments\_Number  
 Check\_Payment\_Volume\_as\_Percent\_of\_Payment\_Volume  
**Transfer Payments**

## Fact Table

Number\_of\_Transfer\_Payments  
Transfer\_Payment\_Volume  
Transfer\_Payment\_Size  
Transfer\_Payment\_Number\_as\_Percent\_of\_Payment\_Number  
Transfer\_Payment\_Volume\_as\_Percent\_of\_Payment\_Volume  
POS Credit Volume as a % of Payment Volume  
**Debits**  
Number of Debits  
Debit Volume  
Average Debit Size  
Number of Debits per Account  
Debit Volume as a % of Line  
Debit Volume as a % of Balance  
Debit Volume as a % of Total Debit Volume  
**Cash Debits**  
Number of Cash Debits  
Cash Debit Volume  
Cash Debit Size  
Cash Debit Number of as a % of Debit Number of  
Cash Debit Volume as a % of Debit Volume  
**Merchandise Debits**  
Number of POS Debits  
POS Debit Volume  
POS Debit Size  
POS Debit Number of as a % of Debit Number of  
POS Debit Volume as a % of Debit Volume  
**Check Debits**  
Number of Check Debits  
Check Debit Volume  
Check Debit Size  
Check Debit Number of as a % of Debit Number of  
Check Debit Volume as a % of Debit Volume  
**Transfer Debits**  
Number of Transfer Debits  
Transfer Debit Volume  
Transfer Debit Size  
Transfer Debit Number of as a % of Debit Number of  
Transfer Debit Volume as a % of Debit Volume  
**Fees and Service Charge Debits**  
Number of Fees/Service Charges  
Fee/Service Charge Volume  
Average Fee/Service Charge Size  
Fee/Service Charge Number of as a % of Debits Number of  
Fee/Service Charge Volume as a % of Debit Volume  
Fee/Service Charge Volume as a % of Balance  
**Fees and Service Charges Waived**  
Number of Fees/Service Charges Waived  
Fee/Service Charge Waived Volume  
Average Fee/Service Charge Waived Size

## Fact Table

Fee/Service Charge Waived Number of as a % of Debit Number of

Fee/Service Charge Waived Volume as a % of Debit Volume

Fee/Service Charge Waived Volume as a % of Balance

**Overlimits**

Number of Overlimits

Overlimit Volume

Average Overlimit

Number of Overlimits as a % of Accounts

Overlimit Volume as a % of Line

**30 Day Delinquency**

Number\_of\_Times

Number\_of\_Accounts

Balances

Average Balance

Number\_of\_Accounts\_as\_percent\_of\_Total\_Accounts

Balances\_as\_percent\_of\_Total\_Balance

Utilization\_Rate

**60 Day Delinquency**

Number\_of\_Times

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**90 Day Delinquency**

Number\_of\_Times

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**120 + Day Delinquency**

Number\_of\_Times

Number of Accounts

Balances

Average Balance

Number of Accounts as a % of Total Accounts

Balances as a % of Total Balance

Utilization Rate

**Behavior Score****Line Increase Requests**

Number of Increase Requests

Amount Requested

% Increase Requests Granted

% Amount Requested Granted

% Increase Requests Declined

**Credit Life Insurance**

## Fact Table

Number of Accounts Covered  
 % of Accounts Covered  
 % of Balances Covered  
**Credit Card Registry**  
 Number of Accounts Covered  
 % of Accounts Covered

**Accounts**

Number of Accounts

Balance

Average Balance

Number of Accounts as a % of Total Accounts

Balance as a % of Total Balance

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Interest Rate**

Cash Rate

Merchandise Rate

**Credit Line**

Total Line

Average Line

Line as a % of Total Exposure

**Line Increase**

Number of Line Increases

Line Increase Volume

Average Line Increase

Number of Line Increases as a % of Accounts

Line Increase Volume as a % of Line

**Utilization**

Utilization Rate

Average Utilization

Utilization as a % of Total Utilization

**Annual Fee**

Fee

Average Fee

**Months Until Renewal**

No Fee Accounts

Fee Accounts

**Payments**

Number of Payments

## Fact Table

**Payment Volume**

Average Payment Size

Number of Payments per Account

Payment Volume as a % of Minimum Amount Due

Payment Volume as a % of Balance

Payment Volume as a % of Total Payment Volume

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**POS Credits**

Number of POS Credits

POS Credit Volume

POS Credit Size

POS Credit Number of as a % of Payment Number of

POS Credit Volume as a % of Payment Volume

**Debits**

Number of Debits

Debit Volume

Average Debit Size

Number of Debits per Account

Debit Volume as a % of Line

Debit Volume as a % of Balance

Debit Volume as a % of Total Debit Volume

**Check Debits**

Number of Check Debits

Check Debit Volume

Check Debit Size

Check Debit Number of as a % of Debit Number of

Check Debit Volume as a % of Debit Volume

**Transfer Debits**

Number of Transfer Debits

Transfer Debit Volume

Transfer Debit Size

Transfer Debit Number of as a % of Debit Number of

## Fact Table

Transfer Debit Volume as a % of Debit Volume  
**Fees and Service Charge Debits**  
 Number of Fees/Service Charges  
 Fee/Service Charge Volume  
 Average Fee/Service Charge Size  
 Fee/Service Charge Number of as a % of Debits Number of  
 Fee/Service Charge Volume as a % of Debit Volume  
 Fee/Service Charge Volume as a % of Balance  
**Fees and Service Charges Waived**  
 Number of Fees/Service Charges Waived  
 Fee/Service Charge Waived Volume  
 Average Fee/Service Charge Waived Size  
 Fee/Service Charge Waived Number of as a % of Debit Number of  
 Fee/Service Charge Waived Volume as a % of Debit Volume  
 Fee/Service Charge Waived Volume as a % of Balance  
**Overlimits**  
 Number of Overlimits  
 Overlimit Volume  
 Average Overlimit  
 Number of Overlimits as a % of Accounts  
 Overlimit Volume as a % of Line  
**30 Day Delinquency**  
 Number of Accounts  
 Balances  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balances as a % of Total Balance  
 Utilization Rate  
**60 Day Delinquency**  
 Number of Accounts  
 Balances  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balances as a % of Total Balance  
 Utilization Rate  
**90 Day Delinquency**  
 Number of Accounts  
 Balances  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balances as a % of Total Balance  
 Utilization Rate  
**120 + Day Delinquency**  
 Number of Accounts  
 Balances  
 Average Balance  
 Number of Accounts as a % of Total Accounts  
 Balances as a % of Total Balance  
 Utilization Rate

## Fact Table

**Behavior Score****Line Increase Requests**

Number of Increase Requests

Amount Requested

% Increase Requests Granted

% Amount Requested Granted

% Increase Requests Declined

**Credit Life Insurance**

Number of Accounts Covered

% of Accounts Covered

% of Balances Covered

(Continued)

**Accounts**

Number of Accounts

Cash Value

Average Cash Value

Number of Accounts as a % of Total Accounts

Cash Value as a % of Total Cash Value

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Premium****Coverage Amount****Payments**

Number of Payments

Payment Volume

Payment Size

Number of Payments as a % of Total Transactions

Payment Volume as a % of Total Transaction Volume

Payment Volume as a % of Cash Value

**Cash Payments**

Number of Cash Payments

Cash Payment Volume

Cash Payment Size

Cash Payment Number of as a % of Payment Number of

Cash Payment Volume as a % of Payment Volume

**Check Payments**

Number of Check Payments

Check Payment Volume

Check Payment Size

## Fact Table

Check Payments Number of as a % of Payments Number of

Check Payment Volume as a % of Payment Volume

**Transfer Payments**

Number of Transfer Payments

Transfer Payment Volume

Transfer Payment Size

Transfer Payment Number of as a % of Payment Number of

Transfer Payment Volume as a % of Payment Volume

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Cash Value

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Cash Value

**Safe Deposit Boxes**

Number of Accounts

Number of Accounts as a % of Total Accounts

Number of Accounts as a % of Total Accounts

**Account Openings**

Number of Account Openings

Number of Account Openings as a % Total Account Openings

Number of Account Openings as a % Total Accounts

Number of Account Openings as a % Total Accounts

**Account Closings**

Number of Account Closings

Number of Account Closings as a % Total Account Closings

Number of Account Closings as a % Total Accounts

**Fees and Service Charges**

Number of Fees/Service Charges

Fee/Service Charge Volume

Average Fee/Service Charge Size

Fee/Service Charge Number of as a % of Total Transaction Number of

Fee/Service Charge Volume as a % of Total Transaction Volume

Fee/Service Charge Volume as a % of Balance

**Fees and Service Charges Waived**

Number of Fees/Service Charges Waived

Fee/Service Charge Waived Volume

Average Fee/Service Charge Waived Size

## Fact Table

Fee/Service Charge Waived Number of as a % of Total Transaction Number of

Fee/Service Charge Waived Volume as a % of Total Transaction Volume

Fee/Service Charge Waived Volume as a % of Balance

**Other miscellaneous attributes**

Campaign\_break\_even\_target\_percentage\*

Campaign\_total\_cost\*

Campaign\_gross\_profit\*

Investments\_number\_of\_trades\_last\_3\_months\*

Investments\_number\_of\_trades\_last\_6\_months\*

Investments\_number\_of\_trades\_last\_12\_months\*

Investments\_risk\_score

Investments\_profit\_score

Investments\_segmentation\_lifestyle\_score

Investments\_segmentation\_behavior\_score

Investments\_segmentation\_attitude\_score

Investments\_attrition\_score

Investments\_attrition\_decile

Investments\_direct\_mail\_flag

Investments\_telemarket\_flag

Investments\_over\_limit\_last\_6\_months

Offers\_accepted\_in\_last\_3\_months

Offers\_received\_in\_last\_3\_months

Offers\_accepted\_in\_last\_6\_months

Offers\_received\_in\_last\_6\_months

Offers\_accepted\_in\_last\_12\_months

Offers\_received\_in\_last\_12\_months

Contacts\_teller\_in\_last\_3\_months

Contacts\_teller\_in\_last\_6\_months

Contacts\_teller\_in\_last\_12\_months

Contacts\_VRU\_in\_last\_3\_months

Unresolved\_contacts\_VRU\_in last\_3\_months

Contacts\_VRU\_in\_last\_6\_months

Unresolved\_contacts\_VRU\_in last\_6\_months

Contacts\_VRU\_in\_last\_12\_months

Unresolved\_contacts\_VRU\_in last\_12\_months

Contacts\_CSR\_in\_last\_3\_months

Unresolved\_contacts\_CSR\_last\_3\_months

Contacts\_CSR\_in\_last\_6\_months

Unresolved\_contacts\_CSR\_last\_6\_months

Contacts\_CSR\_in\_last\_12\_months

Unresolved\_contacts\_CSR\_last\_12\_months

Contacts\_Web\_in\_last\_3\_months

Unresolved\_contacts\_Web\_last\_3\_months

Contacts\_Web\_in\_last\_6\_months

Unresolved\_contacts\_Web\_last\_6\_months

Contacts\_Web\_in\_last\_12\_months

Unresolved\_contacts\_Web\_last\_12\_months

What is Claimed is:

1. A computer-implemented customer relationship management method,  
comprising the steps of:
  - a) defining goals and constraints for a marketing campaign;
  - 5 b) defining market segments and validating defined goals and constraints;
  - c) designing the marketing campaign responsive to results of a) and b);
  - d) executing the designed marketing campaign;
  - e) capturing responses; and
  - f) analyzing campaign results from e);
- 10 wherein each of the steps is executed by a computer.
2. A computer-implemented customer relationship management system,  
comprising:
  - a computer-implemented specification module, for defining goals and  
constraints for a marketing campaign;
  - 15 a computer-implemented analysis module, coupled to the specification  
module, for defining segments and validating goals and constraints;
  - a computer-implemented design module, coupled to the analysis module and  
the specification module, for designing the campaign based on [the]  
results of the specification module and the analysis module; and
  - 20 a computer-implemented execution module, coupled to the design module, for  
generating output for the marketing campaign.
3. The system of claim 2, further comprising:
  - a computer-implemented tracking module, coupled to the execution module,
  - 25 for capturing responses and analyzing campaign results.
4. The method of claim 1, wherein step a) comprises the substeps of:

- a.1) defining an overall goal for the marketing campaign;
- a.2) defining at least one constraint for the marketing campaign; and
- a.3) defining a set of customers for the marketing campaign.

5        5.        The method of claim 4, wherein substep a.1) comprises defining a target value for a variable, the target variable representing a business goal.

6.        The method of claim 4, wherein substep a.2) comprises defining at least one constraint for a parameter of the marketing campaign.

7.        The method of claim 4, wherein step a) further comprises the substep of:
- a.4) specifying a budget for the marketing campaign.

- 10        8.        The method of claim 1, wherein step b) comprises the substeps of:
- b.1) performing an exploratory analysis;
  - b.2) defining a plurality of market segments to be targeted by the marketing campaign, each segment having characteristics;
  - b.3) scoring the defined market segments according to a scoring metric; and
  - 15        b.4) validating the defined constraints.

9.        The method of claim 8, wherein substep b.1) comprises performing a break-even analysis of the marketing campaign.

10.        The method of claim 8, wherein substep b.3) comprises applying a correlation model to determine relationships among market segment characteristics.

- 20        11.        The method of claim 10, wherein the correlation model comprises a predictive model.

12. The method of claim 8, wherein substep b.3) comprises applying a dependency network to determine relationships among market segment characteristics.
13. The method of claim 8, wherein step b) further comprises the substeps  
5 of:
- b.2.1) determining at least one marketing method for the marketing campaign; and
  - b.2.2) determining at least one marketing channel for the marketing campaign.
- 10 14. The method of claim 8, wherein substep b.4) comprises determining whether application of the defined constraints results in conflicts.
- 15 15. The method of claim 1, wherein step c) comprises the substeps of:
- c.1) selecting one of the defined market segments;
  - c.2) dividing the selected market segment into a plurality of cells;
  - 15 c.3) for each of at least a subset of the cells, defining a marketing promotion and associating the defined marketing promotion with the cell.
- 16 16. The method of claim 15, wherein substep c.2) further comprises refining at least one of the cells.
- 20 17. The method of claim 1, wherein step d) comprises the substeps of:
- d.1) specifying an output format for the marketing campaign;
  - d.2) developing a campaign schedule; and
  - d.3) outputting data to at least one marketing channel according to the designed marketing campaign, using the specified output format.
- 25 18. The method of claim 1, wherein:

step a) comprises defining goals and constraints for the marketing campaign  
by specifying positions in a multidimensional space representing values  
for target variables;

and wherein step f) comprises the substeps of:

- 5       f.1)   determining customer positions in the multidimensional space by  
          measuring values of variables associated with the customers; and  
      f.2)   comparing the determined customer positions with the specified  
          positions for the defined goals.

19.    The method of claim 1, further comprising the step of:

- 10       g)    adjusting the designed marketing campaign responsive to results of f).

20.    A computer-implemented customer relationship management system,  
comprising:

- a computer-implemented customer database, containing data describing  
          customers and potential customers;  
15       a computer-implemented data model, coupled to the customer database, for  
          accessing and interpreting data from the customer database;  
          a computer-implemented data access layer, coupled to the data model, for  
          accessing data from the data model;  
          a computer-implemented segmentation module, coupled to the data access  
20       layer, for generating market segments;  
          a computer-implemented report analysis and data mining module, coupled to  
          the segmentation module, for determining scores for market segments;  
          a computer-implemented campaign manager, coupled to the data access layer,  
          for producing a marketing campaign; and  
25       an output device, coupled to the campaign manager, for outputting the  
          marketing campaign.

21. The system of claim 20, further comprising:  
a graphical user interface, coupled to the campaign manager, for accepting  
user input regarding the marketing campaign.
22. The system of claim 20, wherein the segmentation module generates  
5 market segments using statistical clustering.
23. The system of claim 20, further comprising:  
a computer-implemented predictive model library, coupled to the report  
analysis and data mining module, for providing predictive models for  
application to data from the data model.
- 10 24. The system of claim 23, wherein the segmentation module generates  
market segments using predictive models from the predictive model library.
25. The system of claim 23, wherein the report analysis and data mining  
module determines a scored segments set based on application of the predictive  
model library to at least one segment.
- 15 26. The system of claim 20, wherein the campaign manager generates a  
marketing campaign including at least one selected from the group consisting of:  
cells;  
offers;  
channels; and  
20 schedules.
27. The system of claim 20, wherein the campaign manager analyzes  
responses to determine relative success of the marketing campaign.
28. A computer-implemented customer relationship management system,  
comprising:

computer-implemented specification means for defining goals and constraints  
for a marketing campaign;  
computer-implemented analysis means, coupled to the specification means, for  
defining market segments and validating defined goals and constraints;  
5 computer-implemented design means, coupled to the analysis means, for  
designing the marketing campaign responsive to results of the  
specification means and the analysis means; and  
computer-implemented execution means, coupled to the design means, for  
executing the designed marketing campaign.

10 29. The computer-implemented customer relationship management system  
of claim 28, further comprising:

computer-implemented tracking means, coupled to the execution means, for  
capturing responses and analyzing campaign results.

15 30. The computer-implemented customer relationship management system  
of claim 28, wherein the specification means comprises:

computer-implemented goal definition means for defining an overall goal for  
the marketing campaign;

computer-implemented constraint definition means for defining at least one  
constraint for the marketing campaign; and

20 computer-implemented customer definition means for defining a set of  
customers for the marketing campaign.

31. The method of claim 28, wherein the analysis means comprises:

computer-implemented exploratory analysis means for performing an  
exploratory analysis;

25 computer-implemented market segment definition means, for defining a  
plurality of market segments to be targeted by the marketing campaign,  
each segment having characteristics;

computer-implemented scoring means, coupled to the market segment  
definition means, for scoring the defined market segments according to  
a scoring metric; and  
computer-implemented validation means, for validating the defined  
constraints.

32. The method of claim 28, wherein the design means comprises:  
computer-implemented segment selection means, for selecting one of the  
defined market segments;  
computer-implemented cell division means, coupled to the segment selection  
means, for dividing the selected market segment into a plurality of cells;  
and  
computer-implemented promotion definition means, coupled to the cell  
division means, for, for each of at least a subset of the cells, defining a  
marketing promotion and associating the defined marketing promotion  
with the cell.

33. The method of claim 28, wherein the execution means comprises:  
computer-implemented output specification means, for specifying an output  
format for the marketing campaign;  
computer-implemented scheduling means, for developing a campaign  
schedule; and  
computer-implemented output means, coupled to the output specification  
means and to the scheduling means, for outputting data to at least one  
marketing channel according to the designed marketing campaign,  
using the specified output format.

34. A computer program product comprising a computer-usable medium  
having computer-readable code embodied therein for customer relationship  
management, comprising:

computer-readable program code devices configured to cause a computer to  
define goals and constraints for a marketing campaign;  
computer-readable program code devices configured to cause a computer to  
define market segments and validate defined goals and constraints;  
5 computer-readable program code devices configured to cause a computer to  
design the marketing campaign responsive to results of the computer-  
readable program code devices configured to cause a computer to  
define goals and constraints for a marketing campaign and the  
computer-readable program code devices configured to cause a com-  
10 puter to define market segments and validate defined goals and  
constraints; and  
computer-readable program code devices configured to cause a computer to  
execute the designed marketing campaign.

35. The computer program product of claim 34, further comprising:  
15 computer-readable program code devices configured to cause a computer to  
capture responses and analyze campaign results.

36. The computer program product of claim 34, wherein the computer-  
readable program code devices configured to cause a computer to define goals and  
constraints for a marketing campaign comprise:  
20 computer-readable program code devices configured to cause a computer to  
define an overall goal for the marketing campaign;  
computer-readable program code devices configured to cause a computer to  
define at least one constraint for the marketing campaign; and  
computer-readable program code devices configured to cause a computer to  
25 define a set of customers for the marketing campaign.

37. The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to define market segments and validate defined goals and constraints comprise:

- 5 computer-readable program code devices configured to cause a computer to perform an exploratory analysis;
- computer-readable program code devices configured to cause a computer to define a plurality of market segments to be targeted by the marketing campaign, each segment having characteristics;
- computer-readable program code devices configured to cause a computer to
- 10 score the defined market segments according to a scoring metric; and
- computer-readable program code devices configured to cause a computer to validate the defined constraints.

38. The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to design the

15 marketing campaign comprise:

- computer-readable program code devices configured to cause a computer to select one of the defined market segments;
- computer-readable program code devices configured to cause a computer to divide the selected market segment into a plurality of cells; and
- 20 computer-readable program code devices configured to cause a computer to, for each of at least a subset of the cells, define a marketing promotion and associate the defined marketing promotion with the cell.

39. The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to execute the

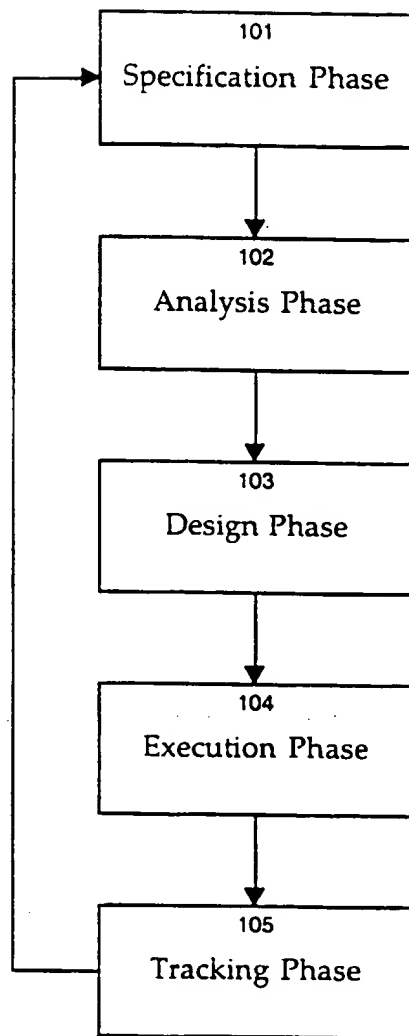
25 designed marketing campaign comprise:

- computer-readable program code devices configured to cause a computer to specify an output format for the marketing campaign;

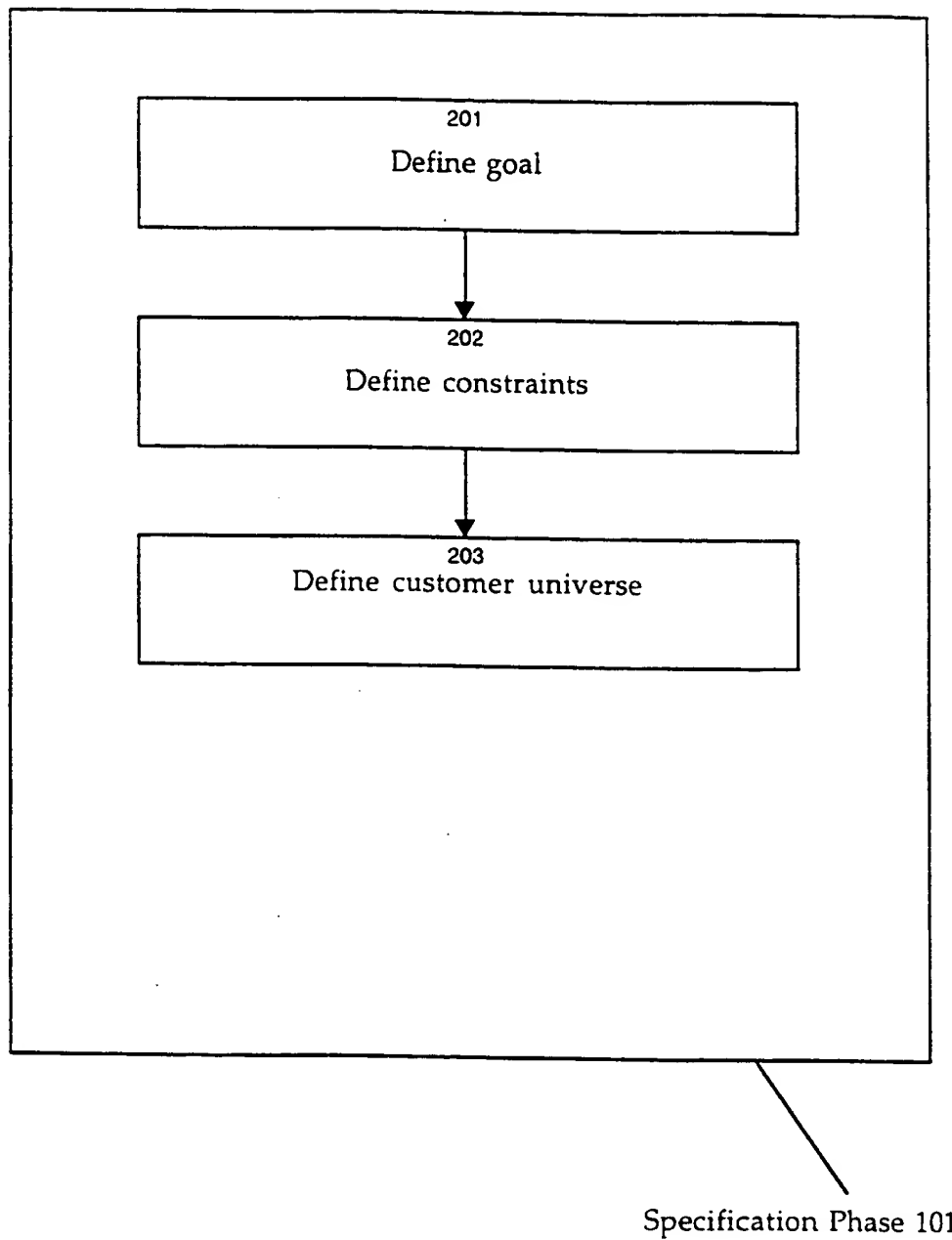
computer-readable program code devices configured to cause a computer to  
develop a campaign schedule; and  
computer-readable program code devices configured to cause a computer to  
output data to at least one marketing channel according to the designed  
marketing campaign, using the specified output format.

5

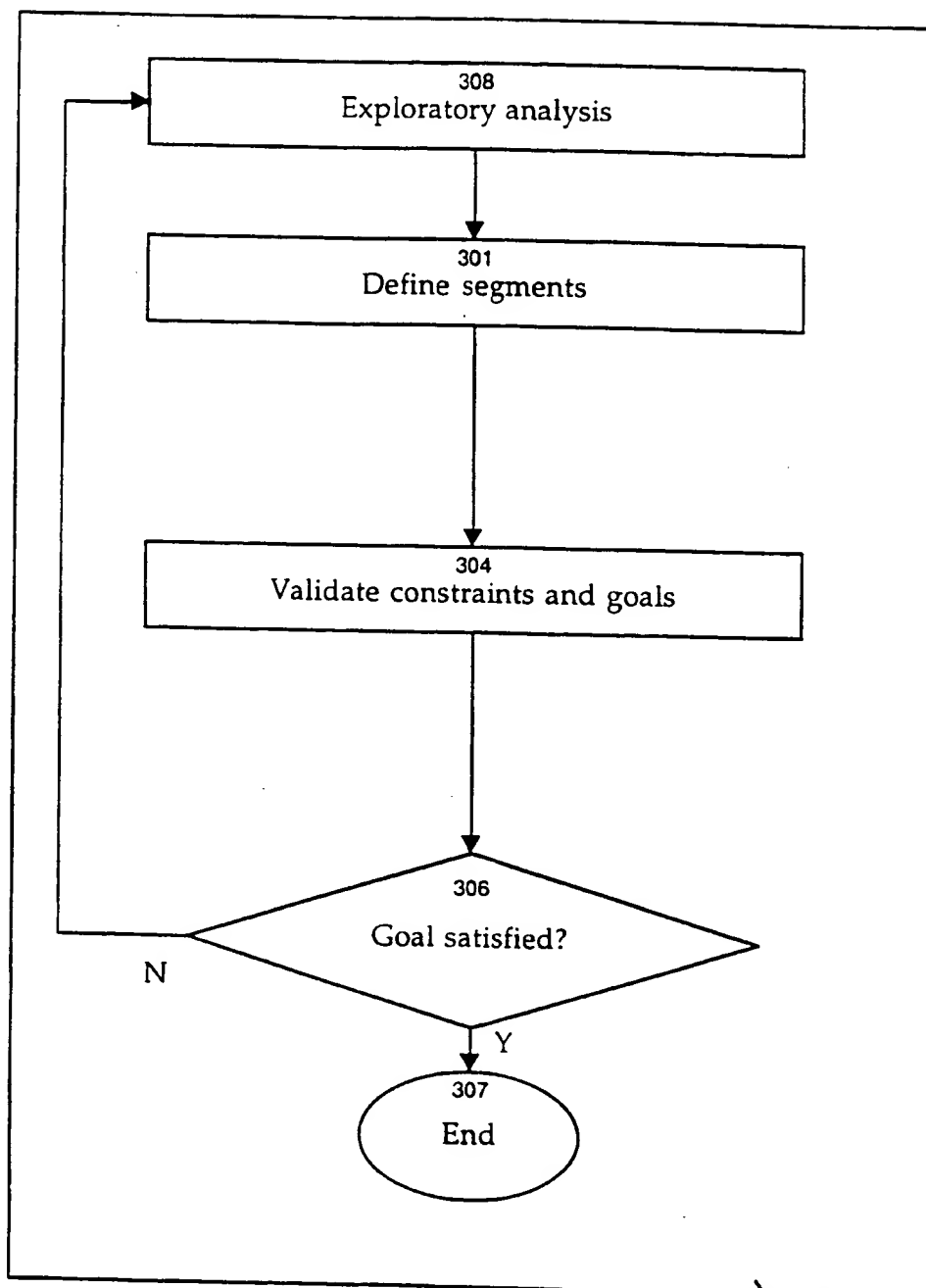
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**FIGURE 1**

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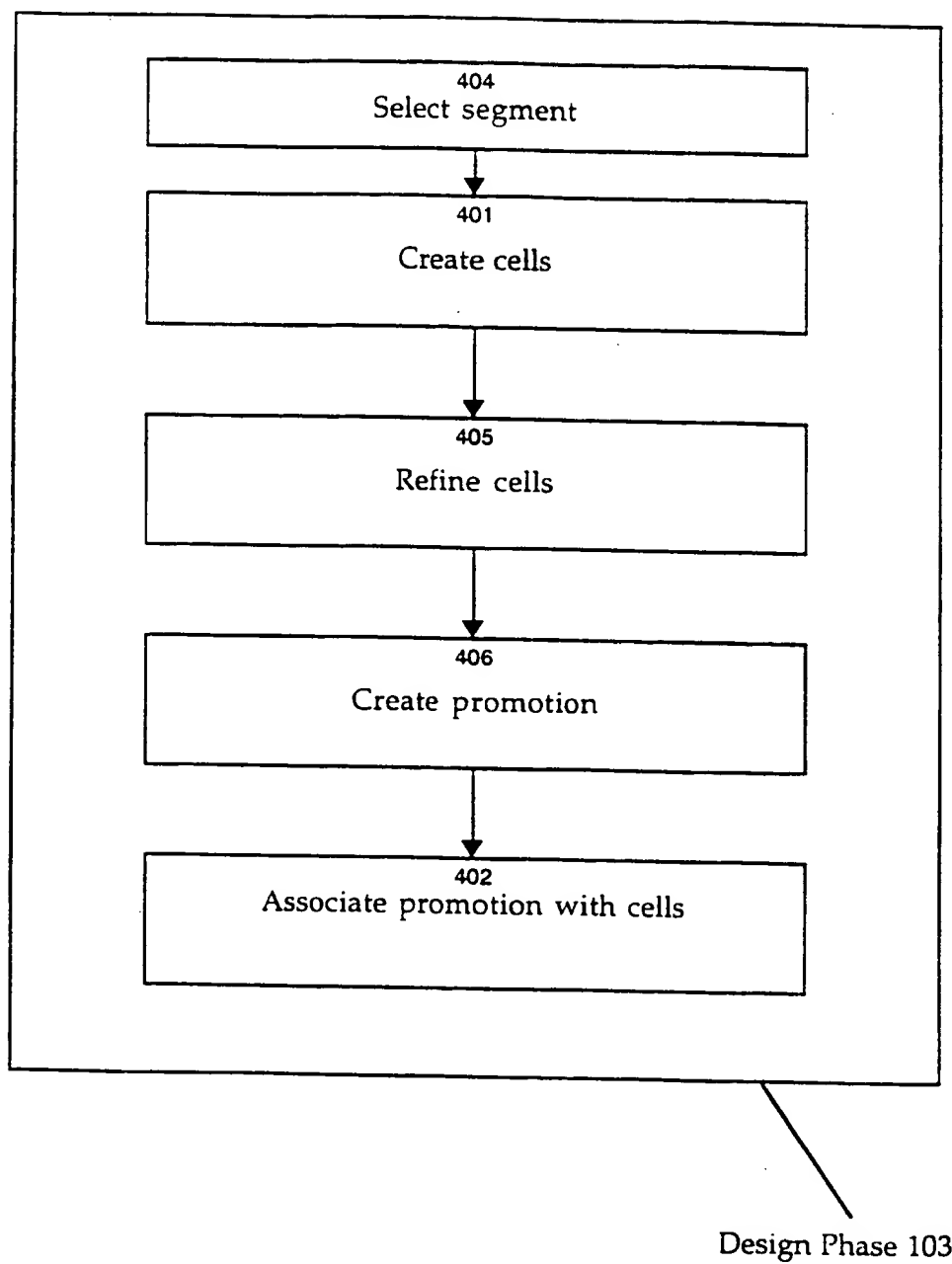
**FIGURE 2**

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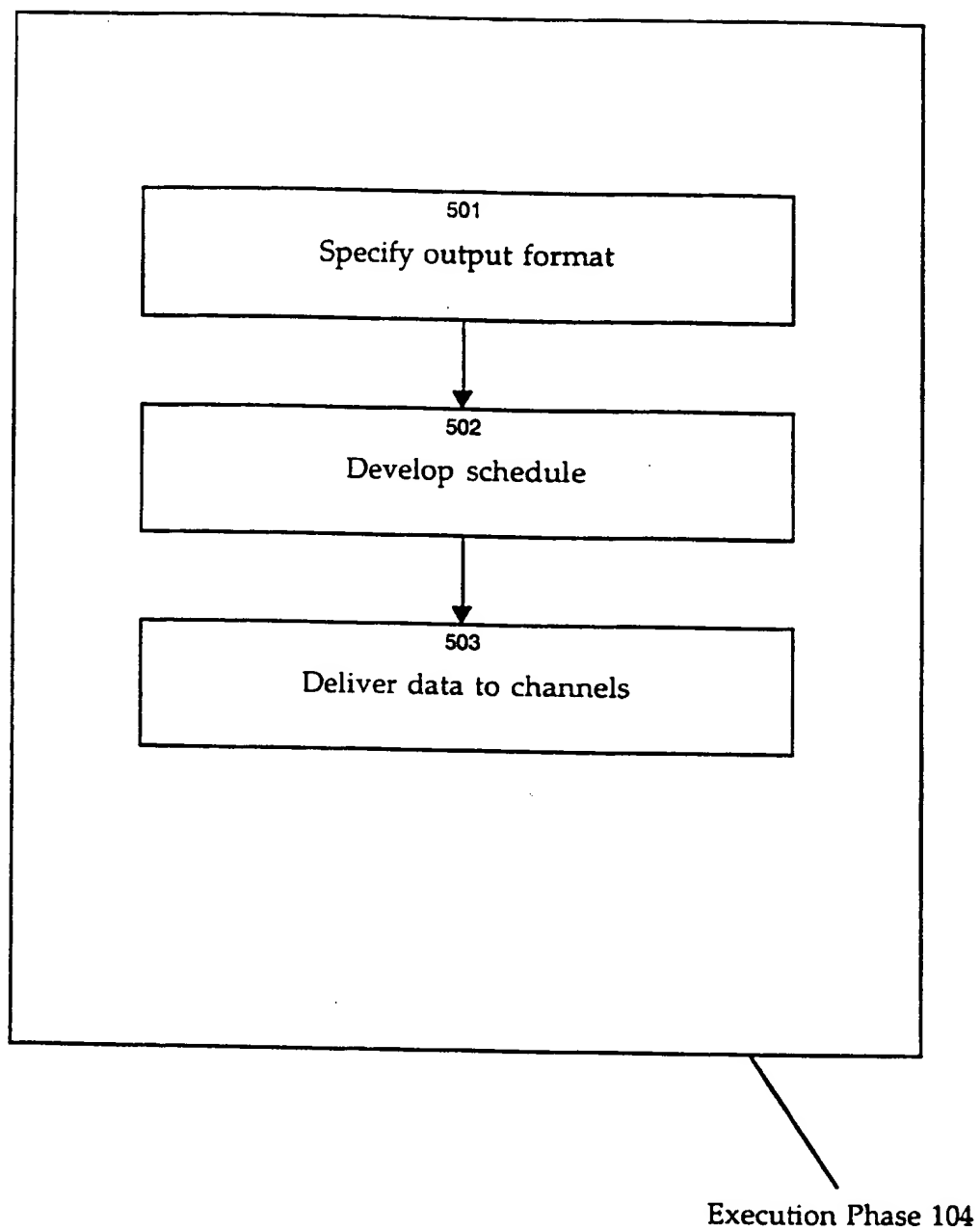
**FIGURE 3**

Analysis Phase 102

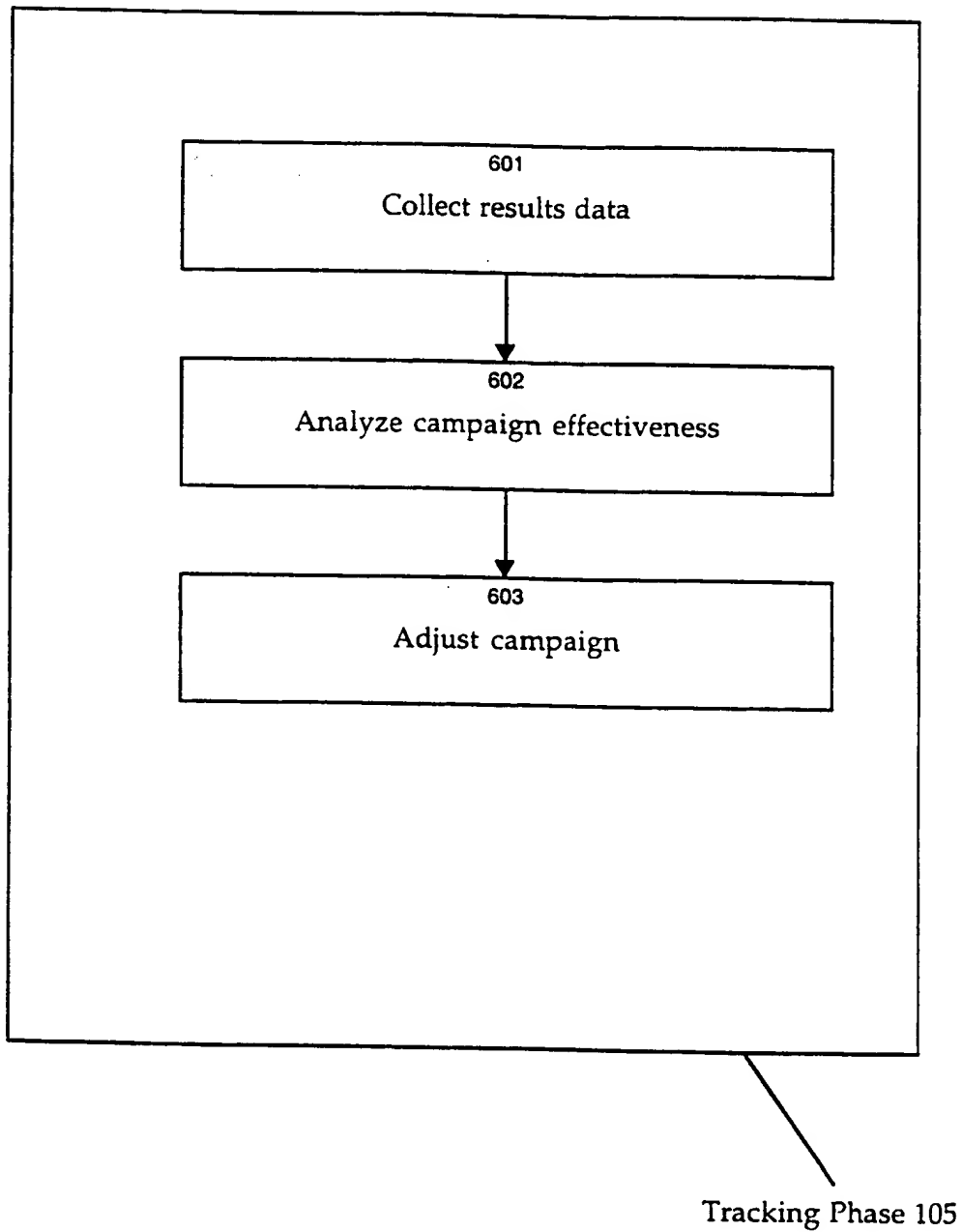
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**FIGURE 4**

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**FIGURE 5**

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**FIGURE 6**

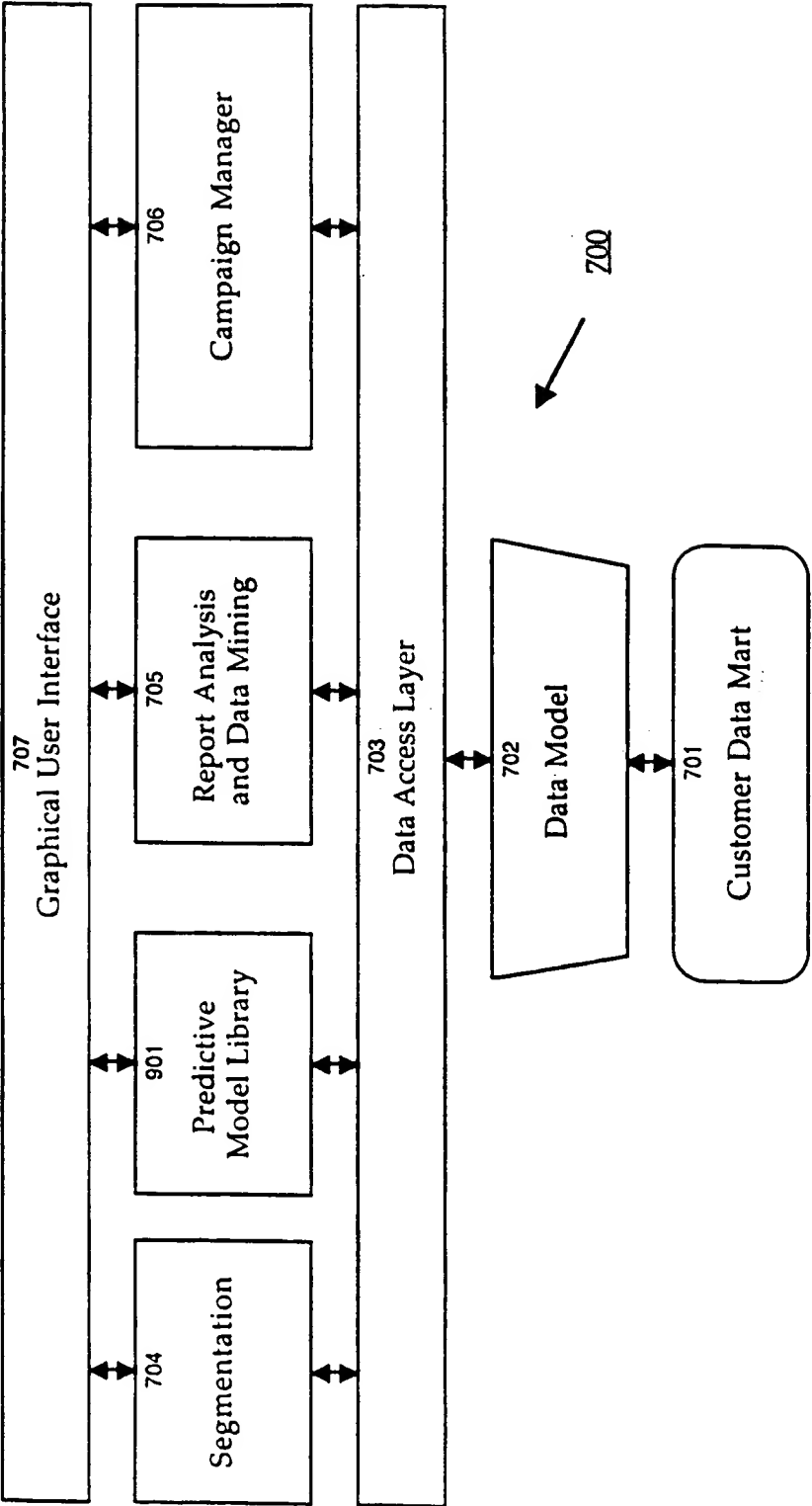


FIGURE 7

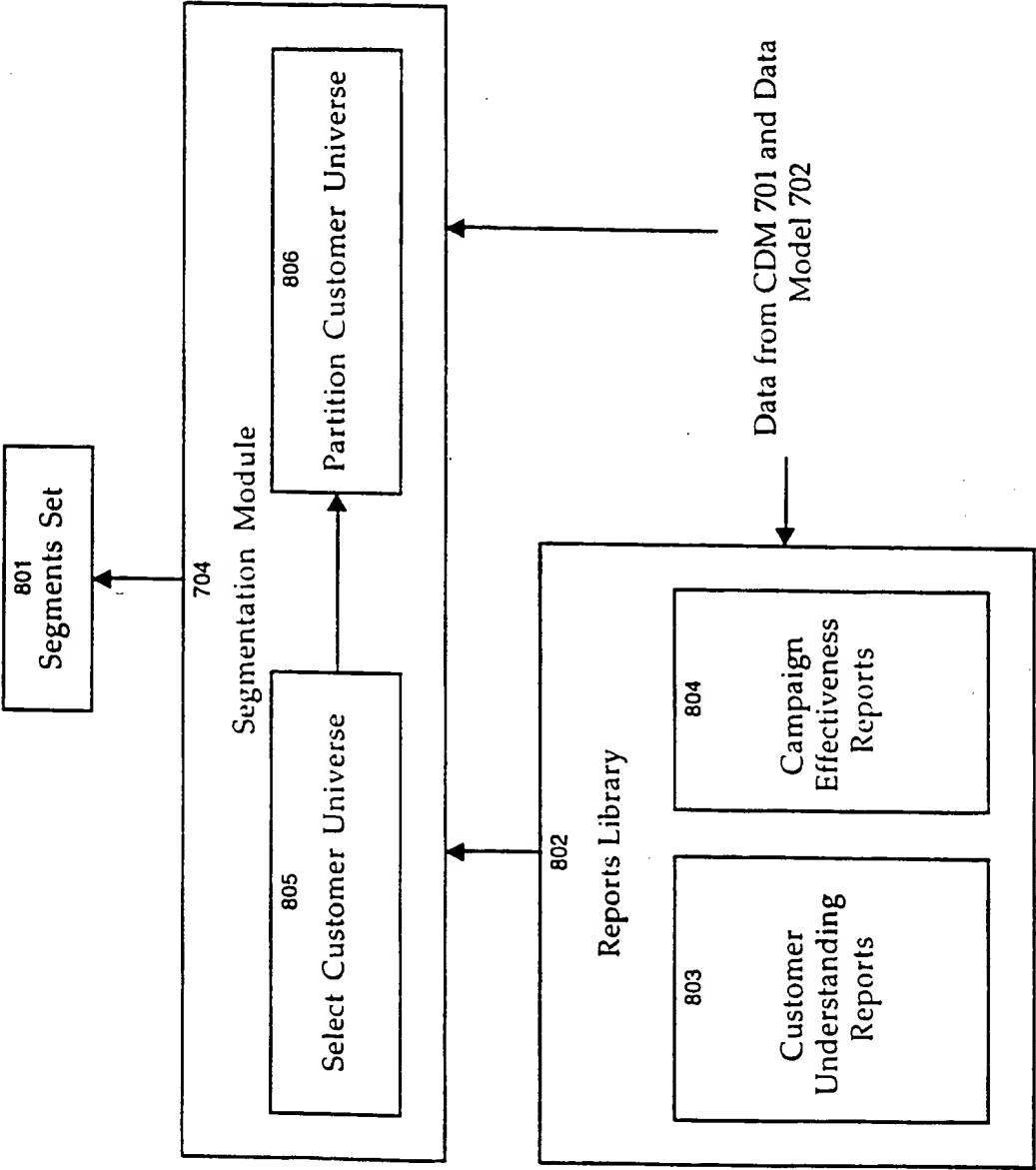
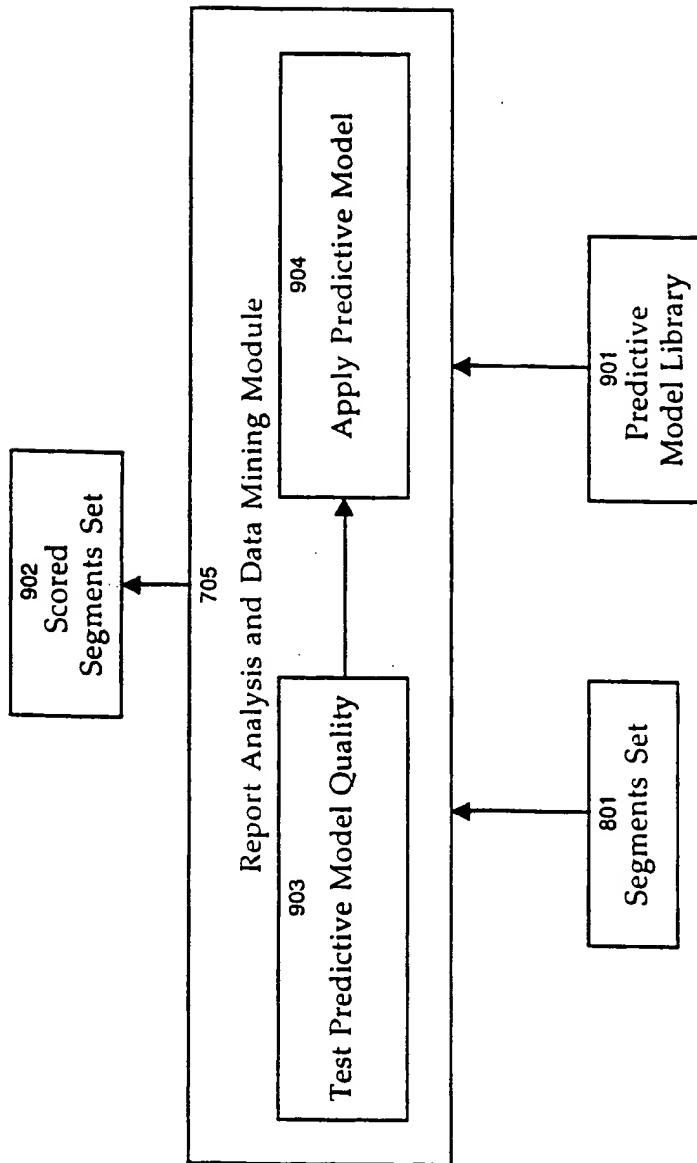
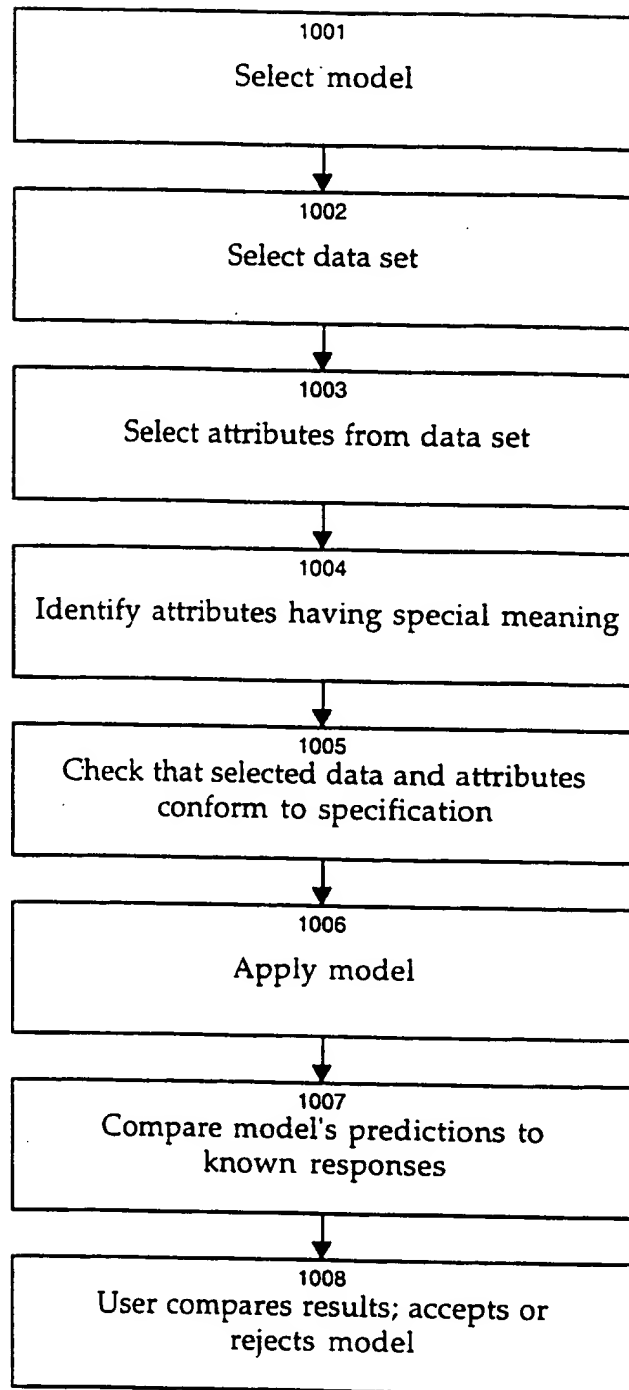


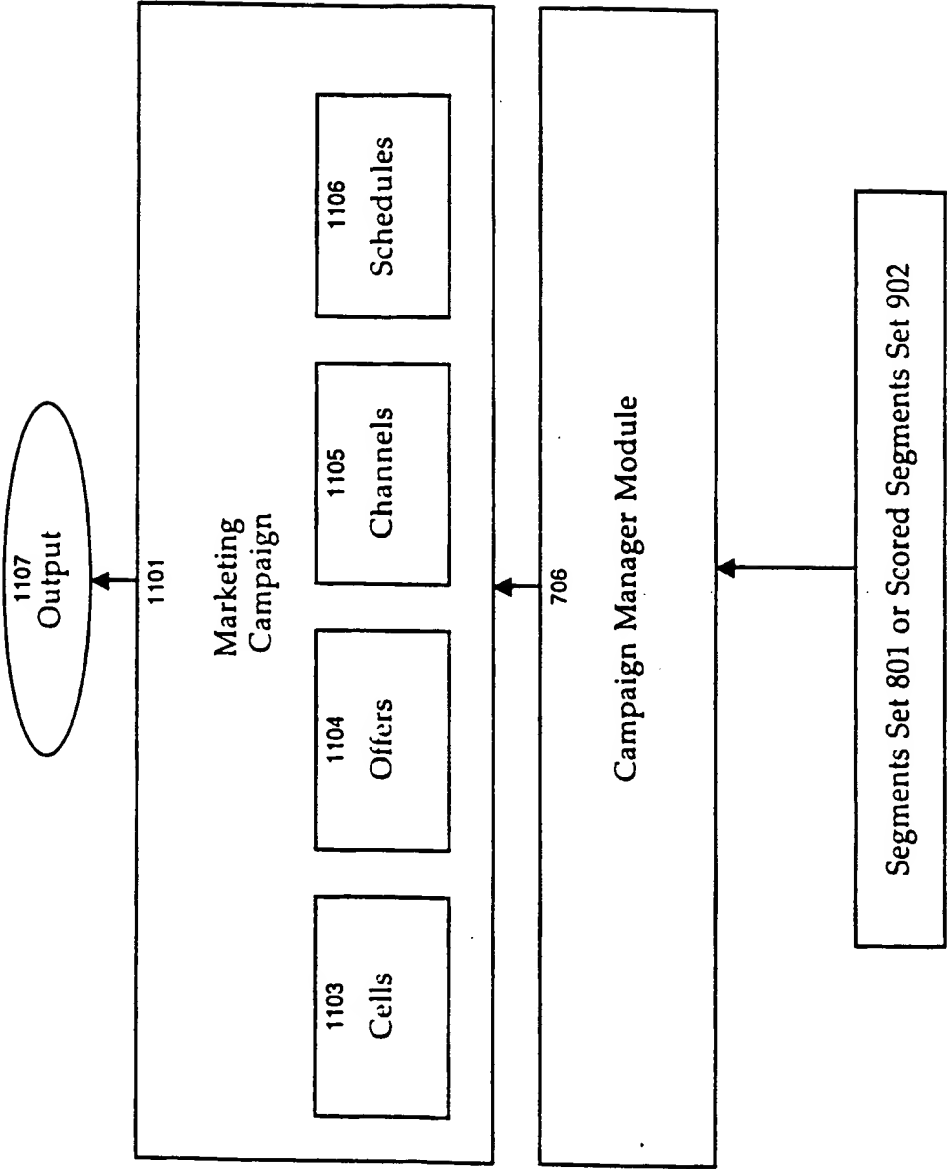
FIGURE 8

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**FIGURE 9**

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**FIGURE 10**



**FIGURE 11**